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Railway Age

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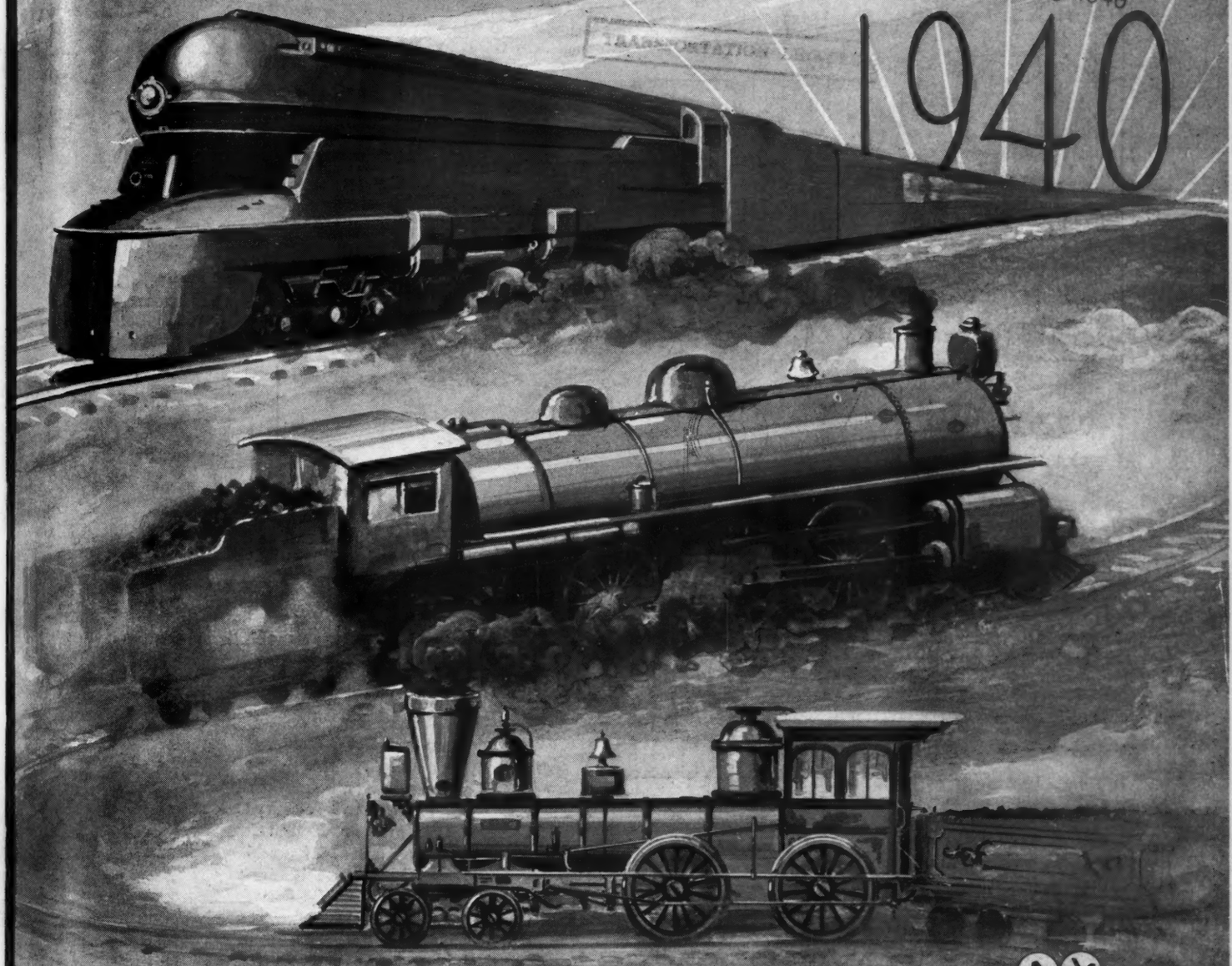

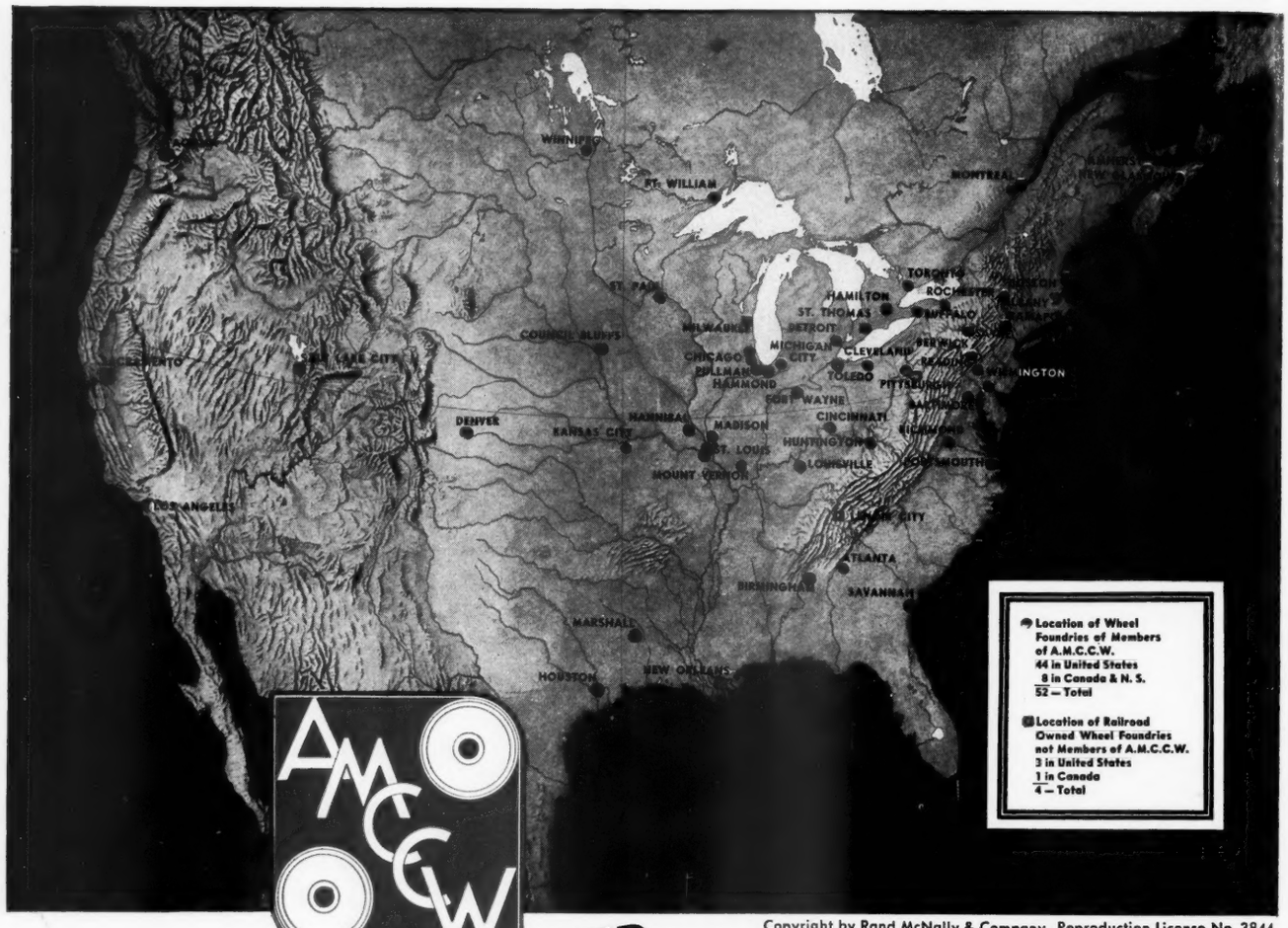

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RAILWAY AGE

Improvement in 1939— Better Outlook for 1940

It is easy as ever, in this "Annual Statistical and Outlook Number" of *Railway Age,* to review what has occurred; but it has become increasingly difficult to explain *why* it occurred. And never in this country was it so hazardous as within recent years to predict what *will* occur in business and on the railroads. The year 1939 well illustrates this.

Before we had a government "planned economy" by which business was to be "stabilized" it was possible, if the general trend of business was downward or upward during the last third or half of a year, to predict confidently that it would continue the same trend during at least the first half of the next year—because that is what it had almost invariably done. But "planned economy" has changed this—like so many other things.

Business, including that of the railroads, expanded steadily throughout the last two-thirds of 1938—and then, instead of continuing upward as expected, it declined until the middle of May, 1939. After that until the middle of September it moved slowly upward; and then expanded to the middle of November the most that it ever did within two months. The gain slowed down a little until the middle of December, making loadings for a month less than in 1936, and then suddenly accelerated and in the week ending December 23 raised loadings 16½ per cent higher than in 1936 and to 76 per cent of the 1925-1929 average—the highest level, allowing for seasonal variations, attained since before the beginning of the recession in June, 1937, and much higher than in the same week of any year since 1930.

"Planned Economy" versus "Stabilization"

Similar fluctuations have been occurring ever since the "planned economy" to "stabilize" was inaugurated in 1933. They never occurred at such short intervals before, and make forecasting unprecedentedly difficult. And that is one of the principal things the matter with business. For the management of every business consists of *prophecy* and *action.* Every decision of management to do or not to do something is based on a conclusion regarding prospects. Every action of management is inspired by some such prophetic conclusion. When business follows trends upward or downward for long periods it is comparatively easy for management to make long-range plans and carry them out. The more it becomes subject to short fluctuations the more difficult it becomes to prophesy with confidence, and the less long-range plans are made and carried out.

And that is bad for business—for in the long run the expansion of business is caused by the investment of large amounts of new capital; and large-scale investment by business is made only by long-range planning and carrying out of plans.

Fluctuations But Great Improvement in 1939

In spite of the feeling of uncertainty engendered by these short-range fluctuations it is a certainty that business in general, and of the railroads and those who manufacture for them in particular, has improved greatly during the last year, and that immediate prospects are excellent. The *Railway Age* forecasted a year ago a net railway operating income in 1939 of 600 million dollars—or 60 per cent more than in 1938. That is one forecast that did not go wrong, for the amount actually earned apparently was almost exactly what was predicted.

On the basis of this forecast of net earnings this paper also prognosticated an increase in railway purchases of equipment and materials from about 400 million dollars in 1938 to about 700 million in 1939. This latter prophecy also approached fulfillment, purchases last year having approximated 700 million dollars. Probably they would have been larger if railway net earnings had been better balanced—that is, if more of them had been made in the first two-thirds of the year and less in the last third. Net earnings in the first two-thirds of the year were only 279 million dollars—less than in the first two-thirds of 1934, 1936 or 1937. During this period purchases increased about 53 per cent over 1938. With December results not yet available, net earnings in the last third of 1939 are estimated at more than 330 million—apparently having been slightly

larger than in 1930, and therefore the largest in the last third of any year since 1929.

As usual, the large increase in traffic and net earnings in the last third of the year caused a large expansion of buying. In an article appearing elsewhere in this issue it is estimated that orders of equipment from manufacturers increased from 74 million dollars in 1938 to 160 million in 1939, and that the value of materials received from manufacturers increased from 343 million to over 538 million—making total estimated buying from manufacturers last year 689 million dollars. It may prove to have been larger when complete data for November and December become available. The estimate of the amount of buying done in 1938 published in our issue of January 7, 1939, was made in somewhat similar circumstances, and proved to be 23 million dollars too small.

Outlook for Railways and Manufacturers

We publish elsewhere in this issue an article estimating that net operating income in 1940 will be about 700 million dollars and giving the reasons therefor. If this forecast should be fulfilled, how large would buying of equipment and materials be? Experience in 1936 and 1937 indicates it would be from 850 to 950 million dollars—probably the largest since 1929. Net operating income in the two years 1936 and 1937 was 1,257 millions, and it would be approximately the same in the two years 1939 and 1940 if our forecast for 1940 should be fulfilled. This amount of net operating income in 1936 and 1937 resulted in buying of equipment and materials in the two years amounting to 1,650 million dollars. To make total purchases in 1939 and 1940 equal those of 1936 and 1937, purchases in 1940 would have to reach 950 million dollars.

An estimate of around 900 million dollars may seem large; but the annual purchases of the railways in the pre-depression years greatly exceeded this amount; and because of their small purchases in the depression years their needs have been steadily increasing. There is good reason, therefore, besides the increase of net operating income in 1939 and the prospective increase in 1940, for believing that purchases this year may exceed those in any year since 1929. The constant decline in the number of units of equipment since 1925, and especially since 1930, seems to have reduced it to a level where equipment retired in future will have to be replaced with equipment of equivalent service capacity. The average number of locomotives retired annually during the five years ending with 1938 was 1,875 and the average number of freight cars 111,737. These are the statistics of the Association of American Railroads; and some of the equipment reported as "retired" was rehabilitated and is included in that reported as "installed." Therefore, the statistics of annual retirements do not indicate accurately the annual number of replacements that will be required in future. But the net decline in number of locomotives during these five years averaged 271 annually and in freight cars 63,200 annually.

Although the large increase in traffic in the fall of 1939 was handled efficiently, the railways actually did not have much of a real surplus of equipment, especially of freight cars, in October. Therefore, it would appear that even if traffic should continue on its present level they would have to buy in every year in future, merely to make replacements, a substantially larger amount of new equipment than they have been acquiring during the depression years; and that if and when prosperity returns they will have to increase their buying of equipment and materials to a much higher annual level than it has reached since 1929 if they are to handle satisfactorily all the traffic offered them.

The Railways in Ten Years of Depression

The year 1939 was the tenth of the present depression and ended the first decade of unbroken depression in the history of the United States. Business was better, of course, in 1936 and 1937, and even in 1939, than in the four years 1932-1935, inclusive; but it never has been as good in *any* of the last nine years as it was in *each* of the preceding eight; and before this depression recovery in this country always meant an increase in production and commerce to new high levels *in proportion to population.*

Railway Results in 1929, 1934 and 1939

	1929 (000)	1934 (000)	1939* (000)	Per Cent Increase or Decrease 1939 compared with 1929	1934
Total Operating Revenues	$6,278,358	$3,270,401	$4,020,000	−36.0	+22.9
Total Operating Expenses	4,506,056	2,441,823	2,925,000	−35.1	+19.8
M. of W. and Struct.	855,355	365,300	473,000	−44.7	+29.5
Maintenance of Equip.	1,202,912	637,906	764,000	−36.5	+19.8
Traffic	130,158	89,249	106,000	−18.6	+18.9
Transportation	2,079,954	1,164,066	1,421,000	−31.7	+22.1
General	193,887	161,525	128,000	−34.0	−20.8
All Other	43,790	23,777	33,000	−24.6	+38.8
Operating Ratio	71.76	74.64	72.76	+ 1.4	− 2.5
Net Operating Revenue	1,772,302	828,578	1,095,000	−38.2	+32.0
Taxes	396,683	239,625	365,000	− 8.0	+52.3
Ordinary	396,683	239,625	256,000	..	..
Payroll	None	None	109,000	..	..
Operating Income	1,375,619	588,953	730,000	−46.9	+23.9
Equipment Rents	95,417	89,849	95,000	− 0.4	+ 5.7
Joint Facility Rents	28,504	36,452	35,000	+22.8	− 4.0
Net Ry. Oper. Income	1,251,698	462,652	600,000	−52.1	+29.7
Other Income	359,747	203,266	150,000	−58.3	−26.2
Total Income	1,611,445	665,918	750,000	−53.5	+12.6
Miscellaneous Deductions	21,979	17,703	23,000	+ 4.6	+29.9
Income Available for Fixed Charges	1,589,466	648,215	727,000	−54.3	+12.2
Fixed Charges	680,439	653,103	619,500	− 9.0	− 5.1
Income after fixed charges	909,027	Def. 4,888	107,500	−88.2	..
Contingent Charges	12,220	11,999	12,500	+ 2.3	+ 4.2
Net Income	896,807	Def.16,887	95,000	−89.4	..

* Estimates for 1939 made by the Bureau of Railway Economics.

The way the railways have fared during the ten years of unbroken depression, and where it left them in 1939, is indicated by statistics for 1929, 1934 and 1939 given in an accompanying table. They show what a terrific decline in their gross earnings had occurred, and also what terrific reductions in operating expenses had been made by 1934—in spite of the latter of which they incurred a deficit after fixed charges in 1934. They also show the measure of recovery that had occurred in 1939.

Their annual gross earnings had declined 3 billion

dollars in 1934; and they had recovered only 750 million, or one-fourth of this, in 1939. Operating expenses had declined more than 2 billion dollars in 1934, and had been increased less than 500 million dollars, or only one-fourth as much, in 1939. Total expenditures for maintenance of the properties in 1929 were more than 2 billion dollars; in 1934 almost exactly 1 billion dollars; and in 1939 about 1¼ billion dollars. The reduction in maintenance expenditures in 1939 compared with 1929 was 40 per cent, in spite of higher wages—the reduction in maintenance of way being about 45 per cent, and in maintenance of equipment about 37 per cent. The reduction in transportation expenses was less than 32 per cent—the effect of maintaining and even improving service while undermaintaining the physical properties.

Taxes Increased 52 Per Cent Since 1934; Net Earnings 30 Per Cent

Taxes had declined relatively the least of any item of outgo in 1934; and had increased relatively the most in 1939. They were more than 1 million dollars a day in 1929; about two-thirds of a million dollars a day in 1934, a decline of 8 per cent; and were up again to 1 million dollars a day in 1939—an increase of 52 per cent over 1934. Of the taxes paid in 1939, about 109 million dollars were payroll taxes—an item that did not appear in the accounts in 1929 or 1934. The railways are now paying these payroll taxes for the benefit of their employees on top of the highest wages in history.

Net operating income declined from more than 1¼ billion dollars in 1929 to less than ½ billion in 1934, and increased to 600 million in 1939—a gain over 1934 of about 30 per cent. After the deduction of fixed and contingent charges there was left in 1929 net income of almost 900 million dollars for dividends, reserves, additions to property, etc.; in 1934 less than nothing at all; in 1939 about 95 million—less than one-ninth as much as in 1929.

Such has been "recovery" on the railroads under a regime dedicated to causing "recovery" and "stabilization" by a "planned economy." The results forcibly remind one of Josef Stalin's two Five-Year Plans and the results as described by Boris Sauvarine in his recent biography of the Russian dictator. "Planned economy" seems to produce much the same results in proportion to previous conditions in every country.

Prospects of Legislation

Developments of all kinds in the railway field are reviewed at some length in articles appearing elsewhere in this issue. The principal controversy last year was regarding proposed legislation in Congress to begin equalization of government policies applied to all competing agencies of transportation. The two bills passed by the Senate and House, and referred to a Conference Committee which will make its report during the present session of Congress, are outlined elsewhere.

It is difficult to decide whether or not to be optimistic about this pending legislation. It has been, and still is being, strongly supported by all the railway labor unions, excepting one, and they have much influence in Washington. The exception is the Brotherhood of Railroad Trainmen, which got adopted, for the "protection" of railway employees, an amendment to the provisions of the House Bill regarding consolidations which would virtually nullify them. Most of the proposed legislation has received support from some important agricultural and business interests, but none worth while from the two principal national business organizations, the Chamber of Commerce of the United States and the National Association of Manufacturers. It has been both openly and covertly opposed by some powerful Big Business interests, especially those who do not want regulation of transportation by inland waterways or the investigation of subsidies in transportation provided for by the Senate bill.

It seems certain that there will be some legislation passed by Congress, but there is reason for fear that it will not contribute greatly toward solution of the nation's transportation problem. Furthermore, powerful business interests are working hard for the repeal of state legislation enacted in the past partly to equalize conditions of competition in transportation, but even more to protect the public's highways and to require commercial users of them to reimburse the taxpayers the cost of providing them with public property on which to do business.

Depression the Principal Problem

It is apparent that the struggle for abolition of federal and state government policies discriminating against the railways in favor of other carriers has only begun. It will be long, and its issue is doubtful. Meantime, railway management will simply have to do everything it can to protect and increase traffic and net earnings by improving service, reducing operating costs and readjusting rates in accordance with the conditions created by the growth of competition. There is evidence that railway management is more alive to the competitive problem than ever before and will initiate and carry out more and more policies expressly for the purpose of solving it.

The principal question that concerns the railroads and every other industry is whether finally business in the United States will recover from the depression and advance to new high levels. The railways are suffering from the diversion of traffic to other carriers. They are also suffering, however, with all other business from the failure of production and commerce, and consequently total traffic, to revive. Comparisons made with production, commerce and traffic in the decade ending with 1929 usually ignore the important fact that the country's population has increased by 15 to 20 per

cent since then. Formerly production, commerce and traffic constantly, with occasional interruptions, increased relatively more than population. Total freight traffic *per capita* handled by all carriers in 1926 was 5,100 ton-miles, and the railways handled 75 per cent of it. Total traffic per capita in 1939 was only about 4,100 ton-miles, or 20 per cent less than in 1926, and the railroads handled only about 65 per cent of it. If, however, total traffic *per capita* had been as large as in 1926, and the railroads had handled only 65 per cent of it, their own traffic would have been almost as large as in 1926 or 1929.

Technical Progress Can Solve the Problem

These facts show that the principal thing the matter with the railways is the principal thing that is the matter with business as a whole—viz., continuance of depression. Is there, then, reason for hoping that depression can and will finally be ended? Probably it would be ended completely and the prosperity the country formerly enjoyed restored within a few years if there should not be adopted during those years by government, business or labor new policies or administration of policies now in effect tending to prevent recovery. In the course of years all business can readjust itself to new rules if the rules under which it must be conducted are not constantly changed. Continued technical progress gradually reduces costs of production and transportation if there are not made changes in wages, prices and other economic factors which prevent technical progress from producing its natural effects.

There is good reason for believing that for some years in future the rules under which the game of business must be played will not be so frequently and radically changed as they have been within recent years. The country's people are losing faith in legislation and activities of government bureaucracies as means of promoting recovery, and are becoming more conservative.

Better Economic Conditions and Public Sentiment

There already has developed, and still is developing, among farmers, politically the most powerful class, a decided hostility toward the efforts of labor unions and their political allies to appropriate for employees of industry and transportation a constantly increasing share of the national income. There is an increasing understanding among business men and farmers that the way to diffuse the benefits of technological progress among all the people and thereby cause it really to contribute toward national prosperity, is to avoid advances in prices and to reduce them as technological progress makes this practicable.

On the whole, therefore, economic conditions and the intelligence and sentiment of the people seem more conducive at the end of 1939 to a prolonged increase of production, commerce and traffic than at the end of any year since the depression began. And the railways are bound to share in any real recovery that occurs, especially if sufficient efforts are made on their behalf to prevent (1) unwarranted increases in their operating costs and taxes, and (2) continuance and intensification of government policies discriminating against them and all agricultural and business interests that must use their service.

Everything here said regarding the outlook is based on the assumption that the United States will do all that should be done to avoid being drawn into a war, and also all that should be done to prepare itself for defense. Nobody can intelligently anticipate what the effects on our national economy of participation in war would be, but fortunately the sentiment of the American people is overwhelmingly opposed to any meddling by our government in the affairs of nations that are now or may become involved in war.

* * * *

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What Will Earnings Be in 1940?

Leaving out of account the war and political depth bombs, 700 millions operating net seems possible

PREDICTION of economic events is a hazardous business at best, and becomes more so, as more and more political and military factors enter the picture. In this space in our Annual Statistical and Outlook Issue a year ago, we stated that it then looked to us as if the railroads ought to earn upwards of 600 million dollars of net railway operating income in 1939. Preliminary estimates indicate that the net railway operating income they actually did earn was about 600 millions.

Our Last Year's Prediction Borne Out

While it happens that our estimate of net railway operating income for last year was very close to the mark, nevertheless events show that chance had much to do with that outcome. There was nothing wrong with our estimate of *economic factors* which appeared in the picture at this time a year ago. They were all set to give us just about such a total volume of business and net operating income as they actually did give. But, early in the year, *political factors* (principally the fear of a war in Europe) began to exert a depressing influence on general business, and this influence made itself felt continuously up through August, when war actually began. Thereafter, the uncertainty about the future having vanished, business began an extremely rapid revival.

The net result was, therefore, that the war in Europe held back business in this country during the first half of the year and stimulated (or, more accurately, ceased to restrain) it in the latter half. So that the minus effects and the plus effects of this *political factor* approximately cancelled each other, and made business for the whole year approximately as it would have been had the war situation throughout the year continued on the same basis as it was a year ago when we made our prediction.

All this is a rather long preliminary to revealing what we believe net railway operating income may be in 1940 —but we don't want anybody to take whatever more-or-less educated guess we are able to give, without fully realizing that *political hazards to any kind of economic forecasting about the transportation business are far greater than they were a year ago.* With a war going on, public sentiment becomes highly volatile, and—since no economist knows what secret new explosives or other engines of war may be turned loose tomorrow and since he has no knowledge of the development of degenerative processes in the holders of dictatorial political power—all he can do is make a prediction "other things being equal."

Leaving out of account the effects of unpredictable political factors, our opinion is that railway traffic and net railway operating income in 1940 will be substantially larger than in 1939. Colonel Leonard Ayres, the well-known economist of the Cleveland Trust Company, estimates that railroad carloadings in 1940 will be greater than in 1939, but by less than 10 per cent. This is a conservative estimate. They were 72 per cent as large in December, 1939, as they averaged in December, 1923-1929. If they merely remained on this same basis throughout 1940 they would be just about 10 per cent larger in the entire year 1940 than they were in 1939.

If unpredictable political factors were all of an adverse nature, the prediction purely on economic grounds of the showing that 1940 is likely to make would probably be of little practical value—because these political factors are certain to have a profound effect on the volume of business in the coming year. However, the unpredictable political factor of a war in Europe in 1939 exercised both minus and plus effects on the American economy in 1939; and there seem to be just as many chances of political factors exercising a plus effect on railroad traffic in 1940 as the reverse.

Laying political potentialities aside for the time being, let us examine the economic evidence. The accompanying chart traces the month-by-month results in freight carloadings and net railway operating income from 1923 to date. The values plotted are percentages of the averages for the same months in 1923-25, thus eliminating seasonal variations. The most obvious observation which strikes the eye on examining this chart is the relatively greater intensity of the ups and downs in net railway operating income than in carloadings. Changes in net railway operating income coincide with those in freight carloadings, but the percentage decline in net operating income is much greater than that in carloadings, when the latter decline; and, conversely, the percentage rise in net operating income is much greater than that in carloadings when the latter turn upward. The ability of the railroads to turn relatively high carloadings into even more favorable ratios of net railway operating income was shown in September and October, 1939, when carloadings, respectively, at the ratio of 72 and 77 per cent of the 1923-25 level produced net railway operating at 75 per cent and 83 per cent respectively of the 1923-25 average. The average net railway operating income earned by the railroads in the years 1923-25 was 1019 million dollars, and 75 per cent of that would be 764 million dollars.

October Level Would Produce 750 Millions

There is little question, therefore, that, if railroad traffic were to be maintained throughout 1940 at the levels it reached this past fall, net railway operating income for the year would be well above 700 million dollars. If it were relatively as large as last September and October it would exceed 750 million, provided there were no appreciable increases in the cost of labor or rises in material prices beyond those which have already occurred.

Labor costs fall in the area of political pressure—and hence they are one of the intangibles, the discussion of which has no place in the weighing of purely economic factors. As for material prices—there may be some rise in these, but no evidence has come our way to sustain a fear of "runaway" prices. Dismissing the labor cost factor as being out of the realm of economic appraisal, there is nothing in the threat of rising material prices so far to warrant discounting the railroads' ability to

turn carloadings at 75 per cent of the 1923-25 level into net railway operating income of approximately the same percentage of that earned in 1923-25.

The inquiry thus resolves itself into a question of what the volume of traffic in 1940 is likely to be. Six or eight weeks ago it was possible to be rather pessimistic on that score. Several leading business economists had concluded that industrial inventories were being rapidly accumulated because of a fear of rising prices—and when inventories are built up in advance of requirements, the time always comes when accumulation ceases and industry begins to use up the inventories it has on hand. However, the National Industrial Conference Board has recently published a study of inventories in the manufacturing industry in which it is shown that, *in proportion to the volume of production,* manufacturers' inventories are relatively low. No accumulation has occurred to occasion such a recession in industrial activity as occurred in 1937 and 1938.

A Good Last Half Foretells a Good First Half

Furthermore, just from empirical observation and without seeking out the causes, it appears from the chart herewith that a rising tendency of carloadings in the latter half of the year has in each case (with the single exception of 1938-39 when the political factor of the approaching war intervened) been followed by loadings at comparatively favorable levels during the first half of the following year. As the biologist, when asked the best means of prolonging human life replied: "Choose long-lived parents," so, the best prescription for favorable traffic in the first half of any given year usually has been to provide a favorable traffic trend in the latter half of the preceding year. The latter half of 1939 has met the terms of that prescription, giving promise for relatively favorable traffic in the first half of 1940. And now for a further empirical observation from the chart: The half-years containing Presidential elections are all shown to have had a rising trend in freight carloadings, despite a widely prevalent belief that business usually is poor in national election years.

We do not count too heavily on such empirical data, particularly since they include such a comparatively few years. Nevertheless, they are entitled to some consideration if other factors are found to support them.

Persons intimately acquainted with the situation in specific industries are more than ordinarily reluctant to make predictions as to what the future holds for them—because of the tremendous potentialities inherent in the European war. However, the survey of Business Opinion issued by the National Industrial Conference Board on December 21 found many of its contributors expecting some decline in activity in January, "but there is general agreement that spring prospects are favorable." The "American Builder" estimates that residential construction in 1940 should exceed that of this year by from 10 to 20 per cent, leaving out of account the political hazards we have mentioned. (A year ago this same authority estimated that 1939 residential construction should exceed that of 1938 by from 25 to 35 per cent, and the actual increase was 37 per cent). An automotive authority reporting to the National Industrial Conference Board expressed the opinion that "We have passed the peak for the present upward movement and the tendency will be downward at a slow rate, with possibly a faster downward rate about February."

J. H. Van Deventer, the editor of "Iron Age", writes us as follows regarding the iron and steel industry:

"Unless unexpected contingencies occur in Europe which will greatly intensify the rate of military activity, there is little prospect for the iron and steel industry of the United States reaching the 1939 peak during 1940.

"This is by no means a pessimistic prediction, because the rate of over 90 per cent in steel production is both unhealthy and unnatural. It is also a rate which is unprofitable to the industry because it increases the bringing in of used, of obsolete and inefficient equipment, which increases manufacturing costs.

"We look forward to a profitable first and second quarter, barring unexpected developments in the European War. Beyond this it is anybody's guess. We do not see the possibility of large war orders in the immediate future since the productive capacity of European nations is great enough, thanks to the five-year influx of American machine tools, to take care of any reasonable munitions requirements.

"The present policy of the industry indicates that so far as steel is concerned there will be no inflationary measures; whatever increases may be made will compensate merely for increased cost of raw materials."

It will be noted that, while Mr. Van Deventer does not expect 1940 to attain the peak that 1939 did, he does not give the opinion that total production in 1940 will fall under that of 1939—because, for almost three-quarters of 1939, production was well below 75 per cent of capacity. (Colonel Ayres believes that iron and steel production in 1940 will not be more than 12 per cent above that of 1939).

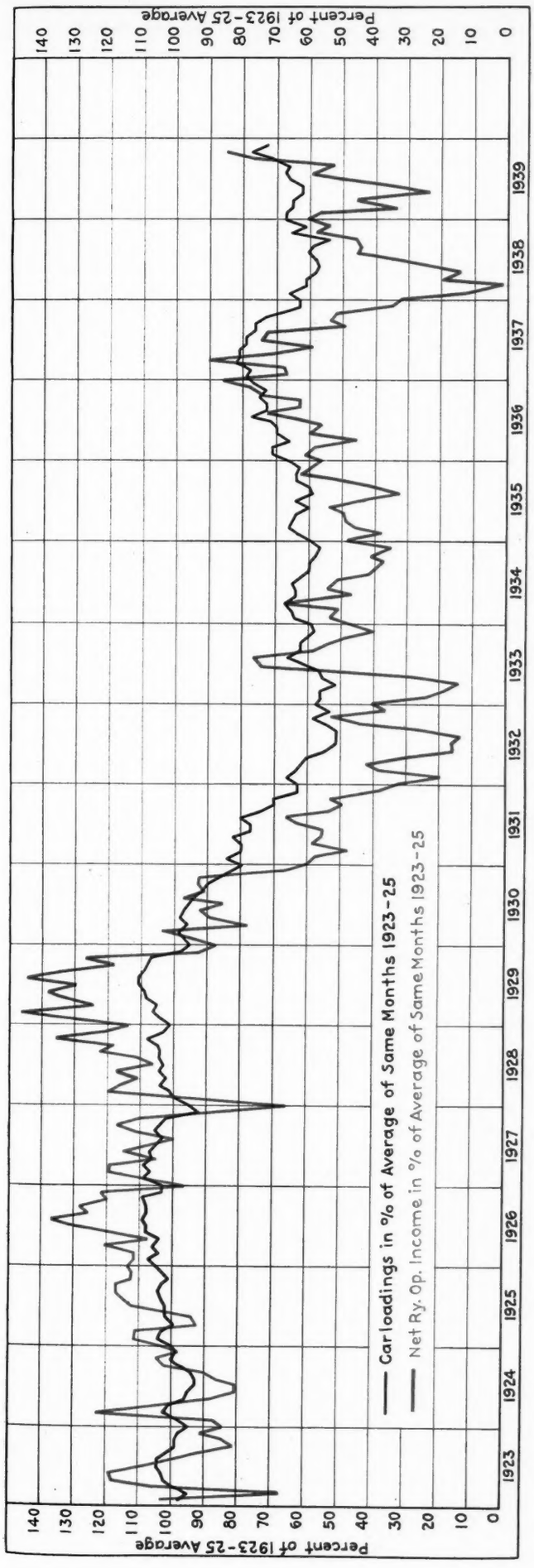
Reports on a large number of individual industries which supply tonnage to the railroads are available, but not the space in which to enumerate them all. Suffice to say, that most of them foresee for the early months of 1940 some decline in the high level which industrial production attained in the latter part of 1939. None of them which we have seen recently, however, appears to expect a serious decline—or that such "easing off" as may occur will be of more than temporary duration. The fact that industrial inventories are not being accumulated out of proportion to the current volume of production argues strongly, both against any decline of serious proportions, and against any extended duration for such decline as may occur.

We can see no *economic* occasion for traffic to decline in 1940 as it did in 1937 and 1938, and again in the early months of 1939. If carloadings throughout 1940 hold—not at the level of October (77 per cent of the 1923-25 average), nor yet at the November level (73 per cent), but only at the December level (72 per cent), such a level would produce 37,000,000 total carloadings during the year; and in 1936 slightly smaller carloadings produced 667 millions of net railway operating income. Taxes and wages are somewhat higher than in 1936, but operating efficiency has increased partly at least to offset them.

All in all, we are inclined to the view that traffic in 1940 is quite likely to exceed that of 1936 and, if it does, the railroads ought to earn in the neighborhood of 700 million dollars of net operating income, *political factors not considered.*

What Are the Adverse Political Factors?

Among the political potentialities, the most spectacular is the war. It does not now appear that the belligerent nations are drawing heavily on this country for supplies, nor that they are going to do so. If they did, or if this country became involved in the war, then, of course, the effect on carloadings would be very great. Efforts being made by the truck manufacturers and road contractors and their allies to secure increased federal and local appropriations to build a vast network of superhighways would have, in the long run, a most unfavorable effect on railway traffic and earnings—but results from this factor will hardly be felt in 1940. The same observation may be made with respect to the attempt being made by



How Net Operating Income Is Related to Carloadings

Chart Shows Carloadings and Net Railway Operating Income in Percentages of Same Months 1923-25

Big Business and political interests to push through the Youngstown, the St. Lawrence, the Tombigbee and other canals. These efforts are directed right at the vitals of the railroad industry, and have discouraged the investment of new capital in it, with the benefits in operating performance which would flow from such investment; and, of course, such forces which discourage the investment of private capital are the forces which are keeping the country impoverished.

Readers of the *Railway Age* need not be reminded that these forces are not altogether, or even primarily, of New Deal origin; that there are no New Deal agencies any more socialistic and fundamentally destructive of private enterprise than such outfits as the National Highway Users Conference and the Mississippi Valley Association, both of which are supported in large degree by Big Business interests who hypocritically denounce the New Deal, while they foster policies with respect to transportation which are an exact parallel, where they are not even more socialistic than, the policies of the New Deal to other business (such, for instance, as electric power).

"Take This Fellow Away—He Is Breaking My Heart"

The N. A. M. has washed its hands, Pontius Pilate fashion, of the transportation situation, urging the various forms of transportation, private and socialistic alike, to get together and work out their disagreements cooperatively; which is like calling on the democratic nations of Europe to "get together" with Hitler and Stalin. However, unregenerate as Big Business is with respect to its policies, nevertheless, it does not appear that, through its efforts to use political power to take traffic away from the railways, it is going to succeed in getting a much larger proportion of it away by this means in 1940 than it did in 1939.

As a matter of fact, there is a considerable body of evidence which would indicate that the *tax-supported competition of the railroads may get even less traffic in proportion away from the rails in 1940 than in 1939.* For one thing, there is the I. C. C. decision in the blackstrap molasses case, which enables the railroads to make quantity rates—and which should enable them to regain a considerable volume of traffic which their competitors are now handling. Furthermore, as has been amply demonstrated in a protracted series of weekly articles in *Railway Age,* the railroads have not used their present cost superiority over their rivals to anything like its full possibilities to retain and regain traffic. Our information is that the railroads are likely to make much greater use of this effective weapon in 1940 than they have heretofore.

So, despite the short-sightedness of Big Business which is fostering socialistic inroads into transportation, there is nothing in the short-run outlook from this angle which needs cause the downward revision of 1940 traffic estimates. On economic evidence alone, it certainly does not seem over-optimistic to hazard a forecast that the railways will exceed 1936's carloadings in 1940; and make net railway operating income in the vicinity of 700 million dollars.

Good Prospects for Legislation

General transportation bill likely to be enacted at present session will comprise a first step in the right direction

GENERAL transportation legislation was among the principal unfinished business before Congress when it reconvened this week, and prospects were reasonably bright for adoption at this session of a conference report in one form or another on S.2009 with provisions designed to bring about equality of regulation as between competing transport agencies. The "equality" in the federal regulatory set-up thus effected will no doubt fall short in both substance and form of what the railroad industry thinks is necessary to produce conditions of "equal opportunity for all, special privilege for none"; but it should nevertheless be appraised as an important forward advance against politically-powerful pressure groups enjoying preferences flowing from the status quo.

Demagoguery in Committee-of-Whole

On this theory that offensive forces in such a political battle are well-advised if they do not hastily ask to see too much of the distant scene, but rather adopt the one-step-at-a-time-is-progress tack, it may be asserted that a real victory was won when both houses of Congress at the last regular session enacted fairly comprehensive transport legislation embodying a sound declaration of policy and provisions for the regulation of water carriers by the Interstate Commerce Commission. That much may be said despite the broad exemptions for various classes of water carriers and other objectionable features of the pending legislation, such as certain amendments demagogued into the House version when it was being considered in committee of the whole.

It will be recalled that the Senate and House versions embody as much of the program recommended by President Roosevelt's railroad committee-of-six as the respective committees on interstate commerce would accept. The House version covers more of the committee-of-six recommendations, but the Senate bill is in the so-called "codified" form, i. e., it rewrites the Interstate Commerce Act to make the general provisions apply to all forms of transport covered, whereas the House bill takes the form of amendments to the present act, including a new Part III for the regulation of water carriers. The codification idea, adopted by committee-of-six counsel in bills drafted for consideration by the Senate and House committees, was advocated by such drafters and committee-of-six members as the best way to bring about equality of regulation. On the other hand, codification has drawn widespread opposition, based mainly upon a contention that motor and water carriers could not be assured that the rewriting would not embody "jokers" to augment the impact of regulation on them.

As the two versions go before the Senate and House conferees, which were scheduled to begin their conferences early this month, the railroads' position might be stated generally as one favoring the Senate bill's form and the House bill's provisions which cover many matters not found in the Senate bill. This latter is, of course, based upon an assumption that the more objectionable of the aforementioned amendments adopted when the bill was before the committee of the whole House will not be embodied in the conference committee's report.

The major controversy in the conference committee is expected to center around the form which the final version is to take—"to codify or not to codify" will be the question. If there is no deadlock on that score there seems to be no other important obstacle to agreement on a conference report, since provisions dealing with the most controversial matter covered—regulation of water carriers by the I.C.C.—are found in both versions. With respect to the codification controversy indications are that there should be no final impasse, and that the conference committee will bring forth an uncodified bill. In the latter connection the opposition to water-carrier regulation is expected to remain strongest in the House; and the "we-don't-know-what's-in-it" argument against codification was a helpful one to the House's "waterway bloc" when coupled with cloakroom talk to the effect that the House conferees would be persuaded to accept a codified bill. In view of this situation it has been indicated in House-conferee circles that there will be no legislation if Senate members of the conference committee insist upon codification. If such an attitude on the part of House conferees becomes an intransigent one, the chances appear reasonably good that the Senate conferees will permit a conference report to materialize.

As noted above, codification was an idea of committee-of-six counsel, one of whom has recently disclaimed any pretention "that the matter of form is of supreme importance," adding that "it would be better to have wholesome legislation in the form of the House bill than to have no legislation at all." Thus while the committee-of-six and the railroad industry generally still regard codification as the best way to apply the act's general provisions without discrimination or distinction and are reluctant to discard a finished job on which an enormous amount of painstaking work has been done, they are nevertheless not expected to urge any adamant stand in that connection upon the Senate conferees.

Outlook for Codification

As for the attitude of the latter, Chairman Wheeler at one point in the Senate hearings conceded to I.C.C. Chairman Eastman (an opponent of codification) that he (Senator Wheeler) might have done it differently if he were initiating the legislation himself; but he pointed out how the codification recommendation had come from the President's committee-of-six, adding that he was offering the codified bill because that committee desired it. Senator Reed, Republican of Kansas, the minority conferee who was most active in the preparation of the Senate version, at the same hearing indicated his agreement with Mr. Eastman's opposition to codification; and he has since sent out a letter to traffic men throughout the country, asking their opinion on the idea of thus embodying the new legislation in a rewritten Interstate Commerce Act. It would seem to be a reasonably safe

assumption that the replies will turn up a majority adverse to codification.

With the codification matter disposed of, the conferees will have the job of reconciling provisions of the two bills. As noted above, the provisions covering the regulation of water carriers are different in that the exemptions set up in the House version are much broader. While railroad spokesmen have expressed the view that the Senate bill goes as far in this matter of exemptions as sound public policy dictates, it is nevertheless quite probable that House conferees will insist upon the more liberal set-up. The latter was not something written in on the floor like the above-mentioned amendments; it was in the bill as reported from the House committee and it no doubt had the effect of keeping some prospective recruits from joining the "waterway bloc" formed in the lower branch to fight any regulation of water carriers by the I.C.C. This "waterway bloc" proved to be a potent one; but it would perhaps be no more successful than it was in the last session in an effort to eliminate the water-carrier provisions — provided the President and Congressional leaders really insist upon adoption of the conference report.

House Bill More Comprehensive

Provisions in the House bill not found in the Senate bill include those covering conditional repeal of land-grant rates; those embodying the so-called Truman-Hobbs bridge bill providing relief for railroads with respect to the cost of reconstructing bridges required to be altered in connection with waterway improvements; the regulation of forwarders; and amendments to the Reconstruction Finance Corporation Act which would facilitate the lending of money to the railroads.

The land-grant-repeal provision would seem to stand a good chance of being included in the final bill, although the condition stipulating that such repeal shall not be effective with respect to any land-grant road which fails to relinquish its claims to additional lands now in litigation with the government may be retained. This condition, supported by government departments interested in the land grants or land-grant rates, was advanced as an "equitable" one; although its impact would be almost entirely upon one road which might well consider the price too high and elect to continue land-grant deductions, thus causing other land-grant roads to meet the competition and rendering the repeal meaningless.

The bridge bill, enacted at the last regular session as a separate measure when it became evident that S.2009 would be left at the conference stage, was subjected to a "pocket veto" by the President. Mr. Roosevelt acted upon the advice of his Secretary of War; but the matter was included in the program of the committee-of-six, and indications are that the House conferees at least are disposed to try again in the general bill.

The regulation of forwarders would be accomplished in the House bill by adding those agencies to the list of common carriers subject to Part I. The Senate disposed of the question for the time being by passing Senate Resolution 146 which authorizes its committee on interstate commerce to investigate railroad methods of handling l.c.l., forwarder and express traffic. Senate conferees may hold out for deferring legislation dealing with forwarders pending the outcome of their sub-committee's probe, which was scheduled to get underway in November but which has been postponed until the committee work on S.2009 has been completed. Also, there is some opinion to the effect that forwarders should have more specialized treatment in the regulatory set-up than would be provided by bringing them in as the House bill does. Furthermore, the views of the I.C.C. may have some bearing; and a majority of the commission, as set forth in the report on its Freight Forwarding Investigation, think the railroads should get together and take over the forwarder function, operating such services through some jointly-owned agency or agencies.

Like the land-grant-repeal provisions, the proposed amendments to the R.F.C. Act include a stipulation which make them objectionable to some railroads. The controversial stipulation is the one whereby the R.F.C. would be permitted to dispose of collateral pledged with it by roads subsequently thrown into receivership or trusteeship—despite the usual legal maneuver of staying such liquidations after a corporation has embarked on bankruptcy procedures.

Senate Bill Provides for Transport Studies

Meanwhile, the Senate bill covers an important matter not dealt with in the House bill, i. e., the provision for appointment by the President of a three-member board to make studies of the relative economy of the various modes of transport and of government aids to transport. The House committee's failure to embody such a provision is understood to have been based on the theory that the bill contains a declaration of policy to guide the I.C.C. in administering its provisions; and the commission can make any investigation it deems pertinent to the carrying out of such a declaration. Also, the Senate bill alone embodies the provisions of the so-called through-routes bill, designed to give the I.C.C. power to prescribe through routes and joint rates without reference to the short-hauling of any carrier; this is favored by the short-line railroads.

Both versions repeal existing provisions of the Interstate Commerce Act which require the I.C.C. to formulate a consolidation plan, and would permit the consummation of mergers upon a commission finding that they would be consistent with the public interest. However, this long-sought change will turn out to mean little or nothing in a practical way unless an emasculating "labor-protection" amendment adopted in the House and discussed below is eliminated. Also, both bills embody the resolution sponsored by Southern congressmen, directing the I.C.C. to investigate interterritorial rates. Despite the commission's recent decision bringing victory to the South in that connection, the provision is apt to be in the final bill; as also is the provision of like purpose to amend the act's sections on discriminations so as to include regions and districts among the areas against which discriminations are prohibited. Neither bill would repeal the long-and-short-haul clause, although the Senate version has a provision designed to expedite fourth-section procedures. Both have virtually identical rules of rate-making, but it is not the language which the committee-of-six wanted. Nor does either bill give the railroads the changes they wanted in the reparations provisions, although some relief would be afforded in that connection.

Objectionable Amendments Eased Into Bill

Among the amendments demagogued into the House version is the aforementioned "labor-protection" stipulation in the consolidation provision—the so-called Harrington amendment, offered by Representative Harrington, Democrat of Iowa, at the behest of the Brotherhood of Railroad Trainmen. It stipulates that the I.C.C. must not approve any consolidation which would result in unemployment or displacement of employees or in

(*Continued on page 12*)

How "Ready" Are the Railroads?

"Break down" cry a fake, but what of blind faith that roads can meet all emergencies on a starvation diet?

THERE was a lot of discussion in 1939 of whether the railroads are "ready" to perform their part in national defense in case this country should become involved in war. Intelligent consideration of the question requires distinctions to be made between different kinds of "readiness". Is "readiness" to be considered their ability to handle a "war load" superimposed on traffic due to conditions of prosperity, or on a sub-normal traffic due to continuance of depression?

"War Load" Alone No Serious Problem

M. J. Gormley, executive assistant of the Association of American Railroads, on the basis of experience when this country was engaged in war in 1917 and 1918, calculates this "war load" at 12 per cent of ordinary commercial traffic and calls attention to the fact that the railroads are handling about 10 per cent less of the country's total commercial traffic than formerly. Obviously, an increase equaling 12 per cent of present railway commercial traffic would be no very large increase, and as the railroads showed themselves ready at the peak of traffic last October to load and move over 861,000 carloads of freight weekly, there would be no difficulty in preparing them to handle a war load superimposed on present traffic.

But, measured by prosperity standards, railroad traffic even at the peak last October was sub-normal. The all-time peak load reached in October, 1926, was 1,209,000 carloads, or 40 per cent higher, and total carloadings in 1926 were 55 per cent larger than in 1939. It is true the railroads handled 75.4 per cent of the country's total commercial traffic in 1926 and only 64.6 per cent in 1937, and possibly even a smaller percentage in 1939. But it is also true that the country's population has increased about 15 per cent since 1926—a factor usually disregarded in estimating how much larger the country's total production, commerce and traffic would be if it were prosperous measured by pre-war standards. If total commercial freight traffic in proportion to population should increase to what it was in 1926, and, as in 1937, the railroads should handle only 64.6 per cent of it, the railroads' share of it would be almost equal to the traffic that they handled in 1926. Obviously, a "war load" of 12 per cent superimposed on the commercial traffic of 1926 would present a very different and much bigger problem than a war load superimposed on present traffic.

Therefore, one important question to be considered is whether, if the United States engages in war, it will probably be under conditions of prosperity or of depression. To assume the latter is to assume that the present depression will be permanent—whereas the last decade is the first since the Civil War in which the country's commercial production, commerce and traffic did not exceed those of any previous decade.

There is another aspect to "readiness". Let us suppose two army divisions, both equally high in morale, efficiently officered and well supplied. But one of the divisions is equipped with Garand rifles and modern mechanized equipment, while the other has Springfield rifles and comparatively little new motor equipment. Both are equally "ready" to go into battle and give as good an account of themselves as human skill and courage permit, but the two units are not "ready" in equal terms at all in comparative military effectiveness.

Mr. Gormley in his recent pamphlet, "Railway Capacity and Traffic Control" (the substance of which was contained in his speech on October 5 before the Atlantic States Shippers Advisory Board and published in the *Railway Age* of October 7, page 526) has clearly set forth the great increase in the efficiency in railroad operation which has occurred since the last war; and he demonstrates that railroad men are prepared to cause the railroads to function to meet any emergency which may arise with a far greater degree of effectiveness than any other group of men could do. Furthermore, he has shown that the carriers are prepared as far as their financial resources will permit (probably even more than such resources justify) to cope with, from a standpoint of capacity, any demands for their services which ordinary business foresight now calls for.

In the opinion of this paper, however, there are two dangerous misconceptions going the rounds with respect to railroad "readiness", as follows:

1. That the railroads are in imminent danger of "breaking down", and that such a "break down" would mean that private enterprise had failed and that socialized ownership and operation is the only alternative.

2. That the "railroads are ready" to handle any peace time or war time load likely to be given them, and hence that there is no railroad problem about which the public need concern itself.

"Break Down" No Argument for Socialism

As to this first misconception, the performance of the carriers in handling the peak of traffic during the past autumn provides an effective corrective. The more than seasonal increase in traffic from August to October, 1939, was phenomenal (from 66 per cent of the 1923-25 average in August to 77 per cent of the average in October), and yet the railroads handled this increase without anything remotely approaching a "break down". This scare stuff which the socialists are disseminating, therefore, is not based on fact. But even if there were any facts behind this "break down" propaganda, those who are spreading it would still have the job of demonstrating that private ownership was responsible.

You cannot stick iron rods in a farmer's wheatfield (as I. W. W. members were reported to have done in the old days), and then blame the farmer for inefficiency when his harvesting machinery is ruined. If the railroads are not as well equipped as the socialists think they ought to be—then who is to blame for that condition, the private owners and managers, or the politicians who have done everything they conceivably could to prevent a revival of prosperity and divert revenues from the railroads to other carriers? Partial control by these politicians has brought all the difficulties under which the railroads labor. If such difficulties constitute a "break down", then complete control by the politicians would logically result in a complete "break down".

That there is no imminent danger of a "break down", and that the railroads are prepared to handle all the business so far likely to be offered them in the immediate future, should not, however, be permitted to conceal important and disturbing facts about the condition of the railroads. Among these facts are the following:

Are These Symptoms of Health?

I. The railroads have in sight a freight car capacity enabling them to load without car shortages not much more than 10 per cent more traffic than they handled during October, 1939.

II. The federal government has systematically starved the railroads, which are its only indispensable heavy-duty transportation agency, while it has poured out billions to develop non-essential, less efficient and duplicate transportation facilities.

III. The average age of railway equipment has been steadily increasing, indicating less reserve capacity to stand up under prolonged heavy usage than at any time in the past.

IV. As a result of policies of the federal government, the credit of most railroads (except for the purchase of new rolling stock) has been destroyed. Capital improvements, adapting technological progress to their requirements, have been largely eliminated on most railroads.

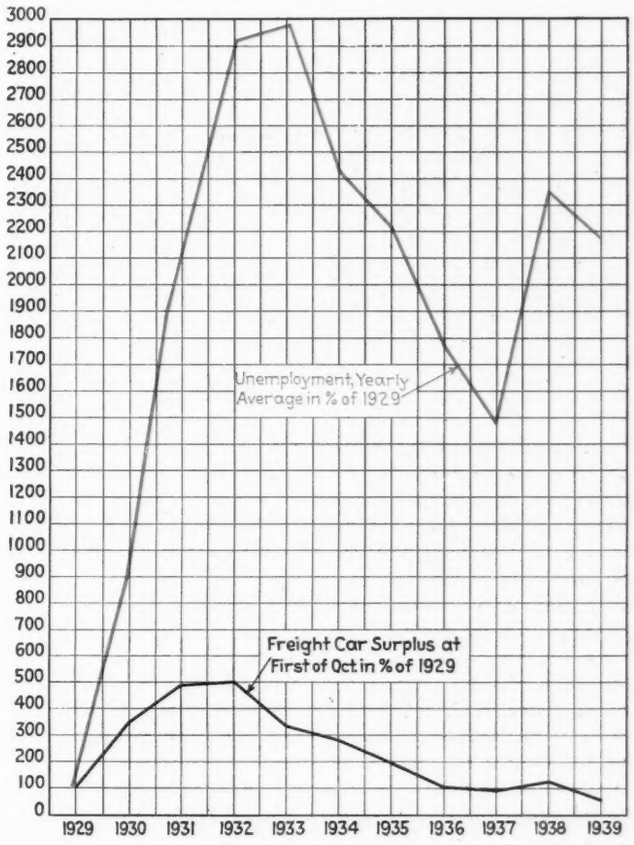
Recent A. A. R. publicity has brought out clearly the increase in the efficiency of railroad operating performance since the days of the last war. It is not necessary, however, to consider increased efficiency in estimating the adequacy of the existing car supply, because up-to-date data are available of its quantity, the efficiency with which it is being used and its adequacy. In the month of October, 1939, the supply was just adequate and no more (i.e., scattering unimportant shortages appeared). Current additions being made by orders for new cars and by reducing the percentage of cars in bad order are just about sufficient to take care of a possible 10 or 12 per cent increase in traffic over the October, 1939, peak.

The situation with respect to the adequacy of both the freight car and the locomotive supply is gone into in detail in articles immediately following this one, and the presentation of the figures here would be repetitious. Suffice to say in this space that *these figures demonstrate that the existing supply of both freight cars and locomotives (including new units on order and the possibility of reducing the ratio of bad order rolling stock) is just about sufficient to accommodate the 12 per cent increase which Mr. Gormley estimates a "war load" to be.*

The age of railway rolling stock also has a bearing on its adequacy (particularly with reference to its ability to run during several critical years with a minimum of maintenance). This also is an aspect of the present equipment situation which is dealt with in detail in the two articles mentioned above.

From a commercial standpoint, the railways are as fully prepared to meet any foreseeable emergencies as they have got any business being (because idle capacity costs money to maintain). *But what would be the situation if, in addition to a "war load" increase in traffic, the railroads were also called on to handle the products of 8,000,000 unemployed recalled to productive labor?* Since 1930 the volume of unemployment in this country has at no time been less than 5,000,000 (and temporarily it has reached almost 15,000,000). The reason these people have been unemployed is that circumstances (largely controlled by politicians) have not permitted business men an opportunity to make a profit at ventures in which they would need the services of the idle workers. A war would either provide the opportunity for a business profit or eliminate the necessity for it. In any event, it would put all employables to work, if the last war's experience is any criterion.

How Much Would Car Surplus Be if Unemployment Were Reduced to the 1929 Level?



It is not here contended that, in addition to being ready to meet a "war load" of 12 per cent more traffic, the railroads *should* also be prepared, with stand-by rolling stock, to handle the products of 8,000,000 unemployed suddenly recalled to work. As a matter of fact, since unemployment has been chronic for so long, any commercial organization which tried to keep its capacity in instant readiness to meet a sudden rush of so many workers back to jobs, would be just plain foolish.

However, in calculating to what extent the "railroads are ready"—from a national point of view—it seems evident that an "emergency" would probably not only bring a "war load" increase of 12 per cent in railroad traffic, but a much larger increase as the result of the return of the unemployed to work.

How About a "Prosperity + War" Load?

Furthermore, there is the possibility (which does not now appear as probable as it did four months ago), that the United States will be called upon—whether ultimately we become involved in the war or not—to furnish large quantities of supplies to the belligerent nations. If this should happen, while the railroads would not be called upon to handle a "war load" increase of 12 per cent in traffic, they might very well have a much larger increase than that. From 1914, when the last war broke out in Europe, to 1916, the year before the United States became a belligerent, freight traffic increased 27 per cent.

Part of this increase was ascribable to a cyclical recovery in business, but a large part of it arose from purchases by European belligerents. The railways today do not have either freight car or freight locomotive capacity sufficient to handle a 27 per cent increase in business. Furthermore, they would be foolish to prepare for such an increase unless and until it appears more likely to occur than it does thus far. But the potentiality is something which ought to concern the politicians in Washington (some of whom seem eager to take on the tremendous job of "economic planning" for the nation, when they have not even made a success at the fundamental governmental function of preparing for the national defense).

On the day, September 2, when the current war in Europe broke out we published an editorial entitled: "Railroads Not Ready for War Even if U. S. Stays out." The socialists immediately began lifting quotations from it, separated from their context, to try to prove that private operation of the railroads had broken down. Loyal railroad people, spurred on by these jibes from the left, have done such a good job of demonstrating the facts about the increase in railway efficiency and readiness to handle traffic that they seem to have given many people the belief that there is no "railroad problem" about which the public needs concern itself.

Taking efficient railroad service for granted seems to us a far more pervasive, and more dangerous, error than the "break down" misrepresentation of which the socialists are guilty. Railroads are the essential reliance of a nation for military defense because—

A. Trucks are too wasteful of man-power, during a time when every man is needed, to be used for anything but auxiliary service.

B. Inland waterways are too slow (and many are blocked with ice in winter) to be relied upon for anything but overload transportation during time of war.

C. Railway capacity can be secured quickly and economically and in almost any desired quantity merely by adding to railway rolling stock (and giving railroad officers the necessary authority to require its efficient use) —whereas equivalent added transportation capacity by highway and waterway means, not only the provision of vehicles, but the slow and costly business of adding to highway and waterway capacity.

Army Needs Railroads—So It Digs Canals

The above are obvious facts of the situation of transportation with respect to national defense—and in the face of them, the civil and military bureaucrats in charge of our national defense have proceeded as follows:

(1) They have promoted the development of inland waterways to the limit of their ingenuity, and with such success that the government has spent in the past decade more money on them than in all previous history.

(2) They have succumbed to the wooing of the "superhighway" enthusiasts to the extent of giving approval to such projects as requisite to the "national defense" (as if 10 per cent of our highway system wouldn't more than accommodate all the motor equipment the army has now or is ever likely to have, merely by closing it off for a few minutes to civilian use). The army also appears to be lending aid to the highway interests' effort to force the states to relinquish control over the sizes and weights of motor vehicles—also on the flimsy pretext of "national defense."

The railroads are ready to contribute the best that their finances will permit to the national defense. That their best is not as great as it might be is a situation for which the very federal officials who are charged with securing our national defense are largely responsible.

Prospects for Legislation

(*Continued from page 9*)

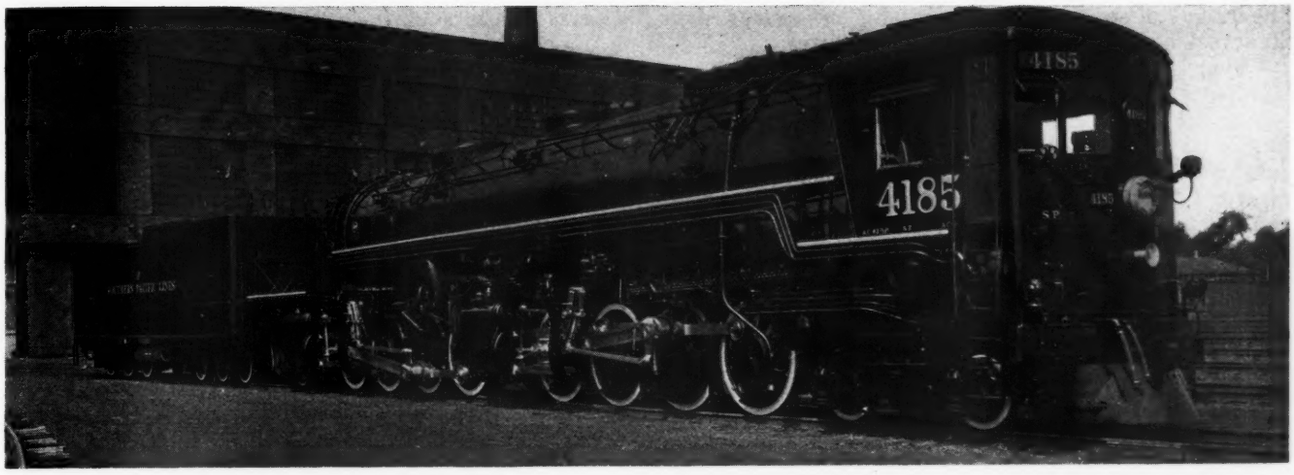
impairment of existing employment rights. This, of course, would bar virtually any consolidation. Meanwhile the Senate version has the workable provision giving the I.C.C. power to condition its approval of any merger upon the inclusion of fair and equitable arrangements for the protection of affected employees. The Railway Labor Executives' Association is satisfied with the latter and for that reason there is hope that the B. of R. T. proposal will be eliminated.

Another amendment objectionable from the railroad standpoint, which was also put in when the House version was before the committee of the whole, is that offered by Representative Wadsworth, Republican of New York, to direct the I.C.C. to permit any carrier to reduce rates so long as the resultant charge remained compensatory after taking into consideration all elements of cost, including overhead. This, and the similar amendment put into the Senate bill by Senator Miller, Democrat of Arkansas, has been assailed by railroad spokesmen as one designed to give water carriers the right to establish any rates they desire and restrict rail carriers in meeting competition. They point out that subsidies cover elements of cost that water carriers would not have to consider in making competitive rates, whereas the railroads would have to include such costs. Then there is the so-called Jones amendment, sponsored by Representative Jones, Democrat of Texas, to require the I.C.C. to prescribe export rates on agricultural products on the same relative basis as it permits the railroads to publish export rates on manufactured articles.

It is to be noted in connection with the hope for the elimination of these objectionable amendments that legislators in the roles of conferees are less "thin-skinned" than they are on the floor, being generally disposed to produce the soundest legislation that can be drafted after reasonable compromises among realistic men.

Aside from S.2009, the reconvened Congress has among its work-in-process many other bills of interest to the railroads. Since no action was taken on transport legislation at the special session, the returning legislators found all such measures where they were left last August 5. A highlight review of the situation at that time will be found in the *Railway Age* of August 12, page 255. In addition to the above-mentioned bridge bill which got the President's "pocket veto," the only important transport measure enacted at the previous session was the Chandler voluntary railroad reorganization act. Operative for only one year from last July 31, the latter gives legal sanction to such plans for readjustment of capital structures as had been worked out by the Baltimore & Ohio and Lehigh Valley.

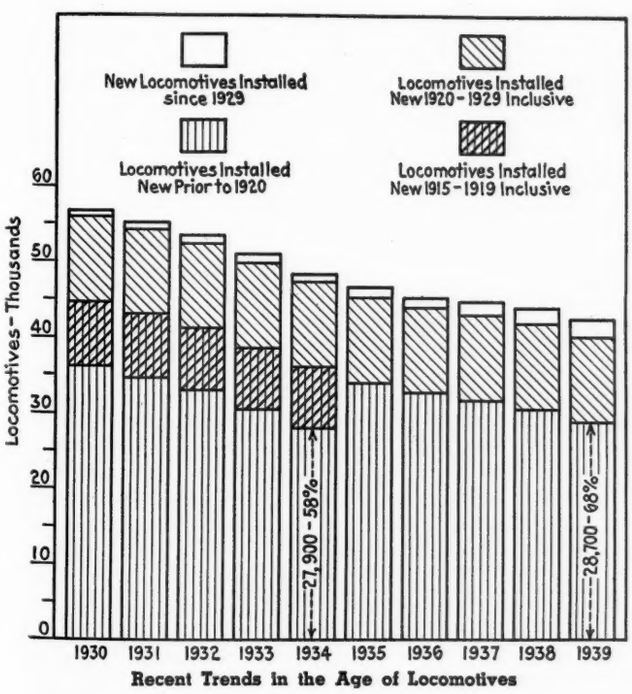
Among the pending measures is the bill proposing a new set-up for the handling of railroad financial reorganizations; this passed the Senate and is now before the House committee on judiciary which last month received a proposed substitute from Chairman Chandler, who has since resigned from the House to become mayor of Memphis, Tenn. Also, the so-called "straitjacket" bill giving the I.C.C. regulatory authority over "outside investments" of railroads, which passed the Senate as S.2903, the modified version which railroad counsel agreed not to oppose. Meanwhile sessions of this Congress have been notable for the lack of the usual crop of "make-work" bills sponsored by organized railroad labor. As a quid pro quo the railroads have refrained from pressing for Railroad Labor Act amendments called for in the Railroad Program.



Fall Peak Used Freight Power Almost to Full Capacity

A reserve of 10 per cent of the freight locomotive capacity was available during the month of October, 1939— Obsolescence still continues to accumulate

IN the inventory of the Class I railroads at the end of 1939 there were about 43,300 locomotives. Of these, 28,700, or 68 per cent, were 20 years old or older. Five years ago, of the 48,300 locomotives at the end of that year, 27,900, or 58 per cent, were 20 years old or older. Not only was the percentage of old locomotive much higher at the end of 1939, but there were actually more locomotives in the 20-year-old-or-older class than there were five years ago.



Recent Trends in the Age of Locomotives

The steady increase in obsolescence in the railway equipment inventory is an old, old story—so old, in fact, that its mention now excites little attention. Back in the early days of federal valuation when obsolescence and depreciation rates were matters of serious and widespread discussion, some railway executives were inclined to ignore obsolescence entirely; they contended that after depreciation had progressed to a certain point adequate maintenance could be expected to conserve the remaining value without further impairment. This was the philosophy of the Irishman's jack knife applied to the equipment inventory—after many years of service it was found to have had two new blades and a new handle, but it was still the same old knife.

Whether or not obsolescence should have been taken into account in the case of the jack knife, it is a very real economic factor in the case of locomotives—a factor the ignoring of which has inescapable consequences even though their evaluation in advance is made difficult by intangibles. The rate at which obsolescence is now accruing depends upon the events of the future: on what changes take place in the requirements of the service and the demands of its patrons; on what improvements in the whole art of conducting transportation, and specifically in the design and construction of motive power, take place during the life of equipment in service today.

It requires rare imagination to produce that degree of conviction which will cause executives to act upon a projection of past experience with these intangibles into the future. Indeed, the possession of such imagination is not in itself enough when inadequate resources place

the leaders of an industry at their wit's end to meet their inescapable and immediately pressing obligations.

What is the significance of the fact that in five years the portion of the locomotive inventory which is 20 years old or older has grown from 58 per cent to 68 per cent? In the first place, it means that locomotives are passing into the 20-year-old-or-older class faster than old locomotives are being retired. It also reflects that fact that fewer than 1,200 locomotives have been added at the top of the inventory during the same period, and that there are only about 2,400 locomotives in service today which are less than 10 years old.

The outstanding trend in railway operation today is the rapidly expanding demand for speed, not in passenger service alone, but in freight service as well. There is little of the freight motive power in the 20-year-old-or-older class which is suitable for modern service. True, the locomotives move freight and move it faster than at the speeds which prevailed when they were new, but the price of speed is high in locomotive and track maintenance and the capacity at high speeds is low.

These are the facts which do not appear when the ability to meet a given volume of traffic demand is under discussion. Then the question is how many train-miles and gross ton-miles can be produced and not the quality of the production.

Capacity of the Motive-Power Inventory

The question of maximum capacity is related to peak traffic conditions rather than to average conditions throughout the year. In attempting to estimate the ultimate possibilities of a given locomotive inventory, therefore, a study of train and locomotive performance during the month of October is likely to give the best results. The data for such a study are shown in one of the tables.

From a study of this table, it will be seen that the highest average monthly mileage of freight locomotives in active service during the month of October occurred in 1939 and was less than 3,200 miles per month; that the highest ratio of active locomotives to total locomotives was in 1926 when it reached 76.5 per cent. Gross ton-miles per train-mile have shown a steady tendency to increase, except during the years of the depression, and last October averaged over 2,100.

Assuming, then, a performance in which all factors approximate the best conditions which have been experienced, the locomotive inventory as of last October, in which there were 22,909 freight locomotives, could provide a maximum of at least 75 per cent, or 17,180 active locomotives. These locomotives, averaging 3,200 miles during the peak month of operation, could be made to produce a total of about 55 million freight locomotive-miles which would have been able to handle 49 million freight train-miles. With an average train load of 2,100 tons, these train-miles would have produced 103 billion gross ton-miles. This is about 10 per cent more than was actually handled during last October and is larger than any peak month since October, 1929. Such a performance would have been at the rate of 68,500 gross ton-miles per 1,000-lb. tractive force. The fact that this is a somewhat more intensive tractive-force utilization than any heretofore attained suggest that this estimate of maximum capacity is reasonably liberal.

While the number of locomotives involved—285 assigned to freight service— is not large enough to affect the general average appreciably, it is of interest to note the remarkable growth in the intensity of utilization of electric locomotives in freight service. In 1937 the average was about 2,500 miles per active electric freight per month and 46,500 gross ton-miles per 1,000-lb. tractive force during the fall peak. In 1938 the utilization had increased to 4,500 miles per active locomotive and 90,000 gross ton-miles per 1,000-lb. tractive force. Last year, while miles per active locomotive per month decreased about 250, the gross ton-miles per 1,000-lb. tractive force increased to almost 102,000.

A Study of Freight Locomotive Utilization During the October Traffic Peaks

	Total freight locos.	Unserviceable	Stored serviceable	Active	Active locos. per cent total locos.	Aggregate tractive force end of year (000)	Loco. miles (000)	G.t.m. excl. loco. and tender (000,000)	Freight train miles (000)	Loco. miles per active loco.	Loco. miles per total locos.	Loco. miles per freight train mile	G.t.m. per 1,000 lb. tractive force (000)	G.t.m. per train mile
1923	33,203	5,947	1,865	25,391	76.5	1,793,785	65,973	92,640	58,492	2,600	1,990	1.13	51.6	1,584
1924	33,359	6,079	3,219	24,061	72.5	1,832,216	62,910	94,730	55,952	2,610	1,880	1.12	51.6	1,693
1925	32,390	5,423	3,055	23,812	73.5	1,827,207	65,568	100,026	58,512	2,760	2,020	1.12	54.7	1,709
1926	31,543	4,782	2,699	24,062	76.5	1,842,369	66,031	107,238	58,798	2,740	2,100	1.12	58.3	1,824
1927	30,960	4,626	3,418	22,916	74.0	1,815,903	64,231	105,797	56,582	2,800	2,070	1.13	58.5	1,870
1928	30,062	4,764	2,971	22,327	74.2	1,796,379	65,165	110,276	57,211	2,920	2,160	1.14	61.2	1,928
1929	28,912	4,477	2,680	21,755	75.5	1,768,968	64,756	110,444	56,748	2,970	2,240	1.14	62.2	1,946
1930	28,738	5,123	4,940	18,675	65.3	1,775,435	54,665	94,931	46,313	2,920	1,910	1.18	53.3	1,965
1931	28,667	6,071	6,225	16,371	57.3	1,755,779	44,903	75,403	40,250	2,740	1,560	1.11	42.8	1,873
1932	27,310	7,891	5,801	13,618	50.0	1,719,166	40,372	66,143	36,344	2,970	1,480	1.11	38.4	1,820
1933	26,925	8,985	3,787	14,153	52.8	1,672,763	40,589	65,812	36,476	2,860	1,510	1.11	39.4	1,804
1934	25,964	8,707	3,402	13,855	53.7	1,597,000	41,205	66,311	37,159	2,960	1,585	1.11	41.3	1,785
1935	25,144	8,414	2,213	14,517	57.9	1,567,482	45,151	75,671	36,858	3,120	1,800	1.22	48.2	1,895
1936	24,498	6,813	1,642	16,043	62.9	1,563,874	50,742	86,987	44,333	3,170	2,070	1.14	55.8	1,948
1937	23,889	5,914	1,673	16,302	68.4	1,556,345	50,117	88,245	44,572	3,070	2,100	1.12	56.5	1,998
1938	23,750	7,300	1,785	14,665	61.9	1,522,439	44,622	79,951	39,615	3,040	1,880	1.12	52.5	2,036
1939	22,909	6,425	832	15,652	68.4	1,506,125	49,945	93,209	44,034	3,190	2,180	1.13	55.6	2,137

Data from I. C. C., Bureau of Statistics, Freight Service Operating Statistics of Class I Steam Railways in the United States (Statement No. M-210); Freight-Train Performance of Class I Steam Railways in the United States (Statement No. M-211 OS-A), and Motive Power and Car Equipment of Class I Steam Railways in the United States (Statement No. M-240 OS-F). Aggregate tractive force based on CS 56A-1 for the end of the year, except 1939 which is as of June 30.

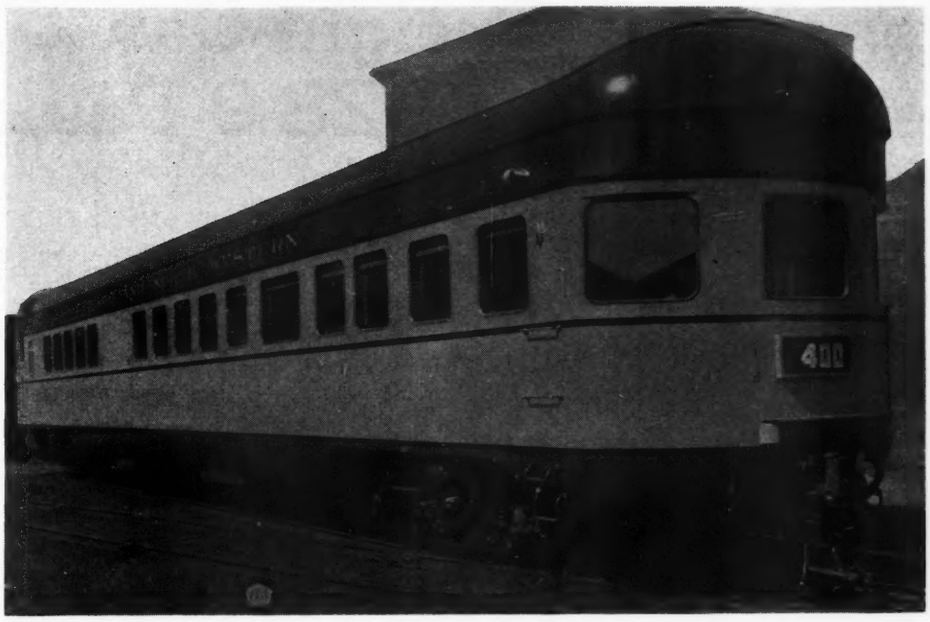
Age Distribution of Locomotives of the Class I Railways, 1930 to 1939, Inclusive

	New locos. installed since 1929*	Locos. installed new 1920-1929, inclusive†	Locos. installed new prior to 1920†	Locos. installed new 1915-1919, inclusive†	Total locos. on line†
1930	809	11,184	44,589	8,520	56,582
1931	995	11,184	42,970	8,400	55,149
1932	1,090	11,184	41,042	8,273	53,316
1933	1,111	11,184	38,608	8,145	50,903
1934	1,195	11,184	35,925	8,017	48,304
1935	1,334	11,184	34,064	....	46,590
1936	1,431	11,184	32,532	....	45,146
1937	1,871	11,184	31,628	....	44,683
1938	2,123	11,184	30,503	....	43,810
1939	2,373	11,184	28,743	....	32,300‡

* From I. C. C. Statistics of Railways in the United States, except 1939, which is estimated.

† Based on I. C. C. statistics.

‡ Estimated.



Progress in Passenger Cars

Outstanding developments of 1939 are in trucks, brakes, lighting and auxiliary power

THE use of the new lightweight or high-tensile materials of construction in passenger cars has ceased to be the exception. All of the passenger-train cars ordered in 1939 are of lightweight construction, employing either low-alloy high-tensile steels, stainless steel, or aluminum alloys as the principal structural materials.

With the exception of a few units, the orders are for individual cars. The few exceptions are combination units for use in trains made up essentially of separate cars rather than for articulated trains.

The majority of the cars ordered during 1939 are intended for use in lightweight, high-speed trains, rather than for general passenger-train service. The extent to which such equipment has been and is being ordered, however, indicates that the time is not far distant when the lightweight cars with smooth exteriors, oval roofs and unhooded ends will be playing an important part in general main-line passenger-train service, as well as in the high-speed de luxe trains.

Individual-Car Power Plants

Among the developments of particular interest during 1939 is the self-contained Diesel-electric auxiliary power plant for use on individual cars, which relieves the motive-power units of all but the traction load. Others of particular interest and significance in the mechanical equipment of passenger rolling stock are the disc and rotor type brakes by which the braking load is removed from the tread of the wheels. The disc brake received its first commercial application during 1939. The so-called rotor type is in the trial stages of its development. The decelostat, for individual automatic control of brake-shoe pressures on each truck in the train, also came into service during the past year. This device is a new approach to the problem of preventing wheel sliding on high-speed trains with high braking ratios.

Continued changes are taking place in truck design with the objective of improving riding qualities and reducing weight. These include easier spring suspension, the use of alloy-steel castings, the trial of inboard roller-bearing journals and short wheel base. The use of cross stabilization has gained some ground.

Fluorescent Lighting

The keynote of inside design, decoration, and furnishings throughout the era of lightweight passenger-car design has been comfort and attractiveness to the point of luxury—a luxury of richness rather than ornateness. The most active progress in this line during 1939 has been in the matter of lighting. With the advent of fluorescent lighting for passenger cars new possibilities in the decorative use of lighting as well as in its adequacy and uniformity of distribution have been opened up. Several applications differing in the methods of employing this new lighting medium were made during the past year.

Although the articulated train may be said to have dropped into the background, so far as the past year is concerned at least, there have been a number of interesting applications of articulated groups for use in trains made up of separate cars. These consist of various kitchen, dining-room, and lunch-counter combinations. The use of such units is effective in meeting special conditions where the conventional dining car with kitchen and dining room in a single vehicle is inadequate to the demands of the traffic.

Intensity of Freight-Car Use Nearly Up to 1928-9 Peaks

Receding margin of reserve capacity marked by increased purchases—New factors affecting the obsolescence of house cars

THE utilization of active freight cars during the fall peak of 1939 reached an intensity higher than that attained in 1928 and 1929 or in any year since that time. The use of total cars on line was only a fraction less intense than during the peaks of two earlier years.

The average weekly loading during the four highest consecutive weeks of the fall peak was 844,000 cars. For the 1,357,000 active cars on line this was an average of 1.61 active cars on line per weekly carloading. The respective figures for 1928 and 1929 are 1.69 and 1.67. The nearest approach to this in any succeeding year, until 1939, was made in both 1936 and 1937 with an average of 1.7 active cars on line per weekly carloading.

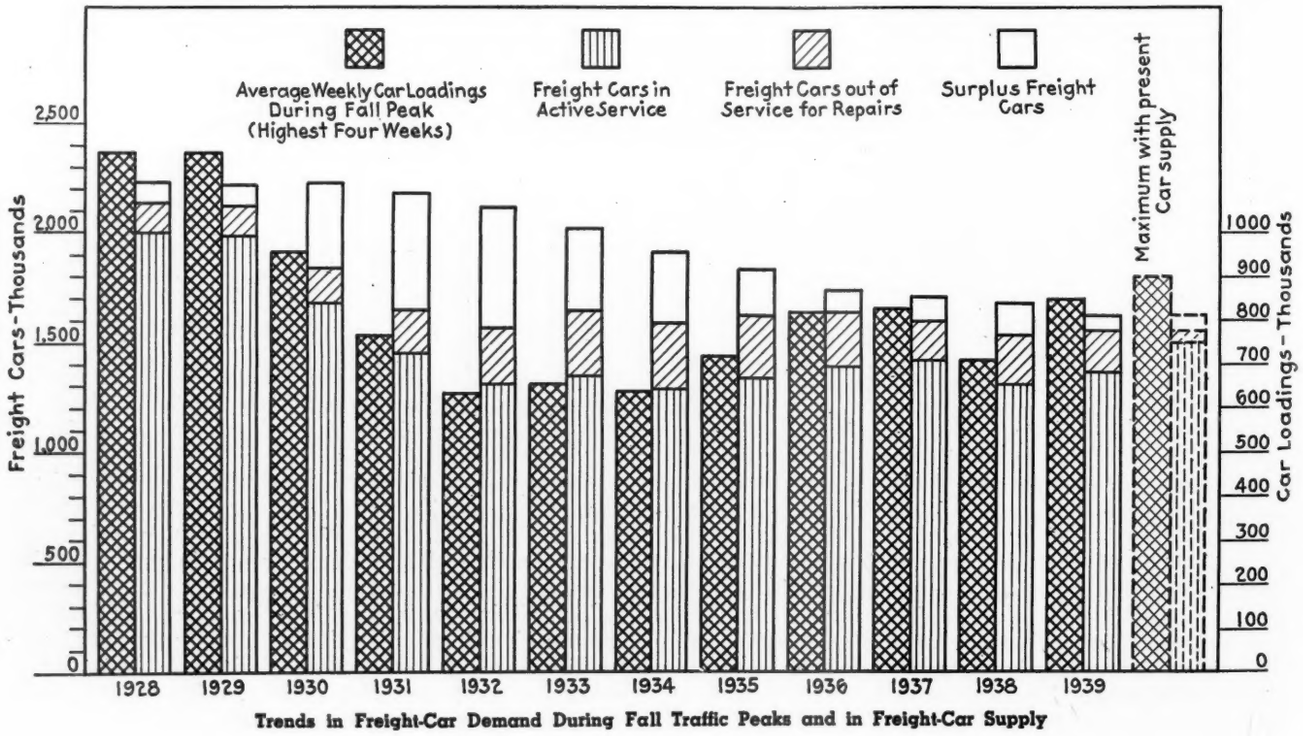
The evidence of the approaching complete saturation of the present car supply, however, is seen in the ratio of carloadings to total cars on line. For the peak last fall this was 1.92, which compares with 1.89 and 1.88 during 1928 and 1929, respectively. At no other time since those years has the ratio fallen below two.

Some Car Shortages in October

With 195,000 cars awaiting repairs, the car surpluses reached a minimum of 64,000 during the fall peak and, as was inevitable with such small surpluses, scattering shortages were reported during a period of about six weeks, with a maximum of 721.

The estimate of the ultimate peak capacity of the current car supply in these annual articles has been based on the assumption that the maximum will be attained when the highest values ever previously attained for the various utilization factors are all reached at once during a fall peak of traffic movement. The best previous performance under such conditions was in 1928 and 1929 when car surpluses reached a minimum of 86,000 and 107,000, respectively, and cars awaiting repairs were 148,000 and 133,000, respectively. This gave a performance of 1.89 and 1.88 cars on line per weekly carloading and 1.69 and 1.67 active cars per weekly carloading, respectively. In both years active cars were 89.5 per cent of total cars on line.

It has been the general experience that when surplus cars are reduced to a point approaching, or drop below, 100,000, scattering shortages begin to appear. Evidence of this is afforded by the experience in the fall of 1928, 1929, 1936, 1937, and 1939. The weight of past experience indicates that to anticipate a surplus of 64,000 as a safe factor in the car supply situation during the fall traffic peak is extremely dangerous even though the recorded shortages of last fall were no greater than those in 1936 when the minimum surplus was 112,000. If, then, we assume that a surplus of 100,000 is about the minimum which can safely be anticipated without danger of excessive shortages and reduce bad orders to a minimum of 6 per cent, the active car supply of last fall could have been increased to about 1,420,000 and with a utiliza-



Trends in Freight-Car Demand During Fall Traffic Peaks and in Freight-Car Supply

tion equal to 1.61 active cars per average weekly carloading during the four weeks' peak, a maximum of about 880,000 carloads could have been handled. This would bring the utilization of cars on line to 1.84 per weekly carloading—lower than any yet attained.

Fall Peak, Not Average Loading, the Test

In using this estimate of ultimate capacity, it must be kept in mind that it is not an indication of the maximum annual traffic which can be handled since it is confined to the consideration of utilization during the four highest weeks of the fall peak. Since it is the fall peak, however, which most immediately affects the attitude of the railways toward the freight-car inventory, the probable maximum capacity of the current car supply has a fairly definite relationship to the purchases and freight-car maintenance programs of the railroads. It must also be kept in mind that any index of freight-car capacity on a national basis conceals the numerous individual situations of which it is the combined effect, in some of which saturation of the available car supply is attained long before and, in others, much later than for the railroads of the United States as a whole. Considerably before the ultimate capacity of the national freight-car inventory is reached, therefore, the demand for new cars makes itself felt. During 1939, for instance, orders were placed for over 50,000 freight cars in the United States, whereas in 1938 when peak carloads only slightly exceeded 700,000 per week orders were placed for about 16,500. With a prospective peak loading of 875,000 to 900,000 cars per week, orders would probably double those of the current year. This would reflect not only the need for additional freight-car capacity, but replacements to reduce obsolescence as well.

An evaluation of the obsolescence of the freight-car inventory presents considerable difficulty. During the past 10 years some 870,000 to 875,000 freight cars have been retired. During the same period, fewer than 300,000 new cars have been installed. Other cars, however, have been rebuilt and repaired with betterments which have effected a considerable reduction of obsolescence. Even if one were to evaluate the effect of these retirements and additions on the average age of the cars in service, the result would scarcely be indicative of the true state of the inventory, since developments making for obsolescence of freight cars have not taken place at a uniform rate during the life history of the cars now in service. It is only within the past few years that new structural materials have made it possible to effect material reductions in freight-car weight, while such factors as the new AB brake and snubbing devices for improvements in the riding of freight-car trucks are applicable to the existing inventory without other major changes.

Obsolescent Box Cars

A recent change affecting the obsolescence of box cars is a growing realization on the part of the railroads that present cars are unsatisfactory for the shipment of many types of merchandise, and particularly for l.c.l merchandise, and that the lack of a completely satisfactory cars is a cause of traffic losses to the railroads. The demand is for a car which can be operated at high speed and which will protect the lading from damaging longitudinal, vertical and lateral shocks. The type of high-speed merchandise train service which has already been initiated on some railroads calls for box cars which can operate at passenger-train speeds and ride like passenger-train cars. Indeed, passenger-train cars are being used in some of these services. With the announcement of the results of the A.A.R. high-speed freight-car-truck tests, box cars to meet the exacting new requirements will become a factor in the freight-car market.

Trends in Freight-Car Supply and Freight-Car Utilization

	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	Probable maximum utilization with scattering shortages
Peak loading (000)*	1,184	1,186	960	768	635	658	641	721	820	832	711	844	880
Cars on line (Oct. 1) (000)	2,238	2,223	2,226	2,178	2,118	2,019	1,908	1,834	1,743	1,705	1,673	1,616	1,616
Surpluses, minimum (000)	86	107	389	532	545	377	318	208	112	102	139	64	100
Awaiting repairs (Oct. 1) (000)	148	133	157	194	262	295	296	284	242	188	231	195	97
Active cars (000)	2,004	1,983	1,680	1,452	1,311	1,347	1,294	1,342	1,389	1,415	1,303	1,357	1,419
Cars on line per weekly carload	1.89	1.88	2.32	2.84	3.34	3.07	2.98	2.55	2.13	2.05	2.35	1.92	1.84
Active cars per weekly carload	1.69	1.67	1.75	1.89	2.06	2.05	2.02	1.86	1.70	1.70	1.83	1.61	1.61
Active cars per cent of cars on line	89.5	89.5	75.5	66.7	62.0	66.8	68.0	73.4	80.0	83.0	78.0	83.9	88.0
Car shortages	Sept. 23-Oct. 22†	Sept. 23-Oct. 31†	None	None	None	None	None	None	Sept. 30-Dec. 30	Jan. 1-July 31	None	Sept. 15-Oct. 31	....
Maximum shortages reported	454	....	....	....	....	....	....	....	836	3,035	....	721	....

* Average of four highest consecutive weeks.
†Small shortages, each aggregating fewer than 100 cars, were reported during a number of weeks earlier in the year.

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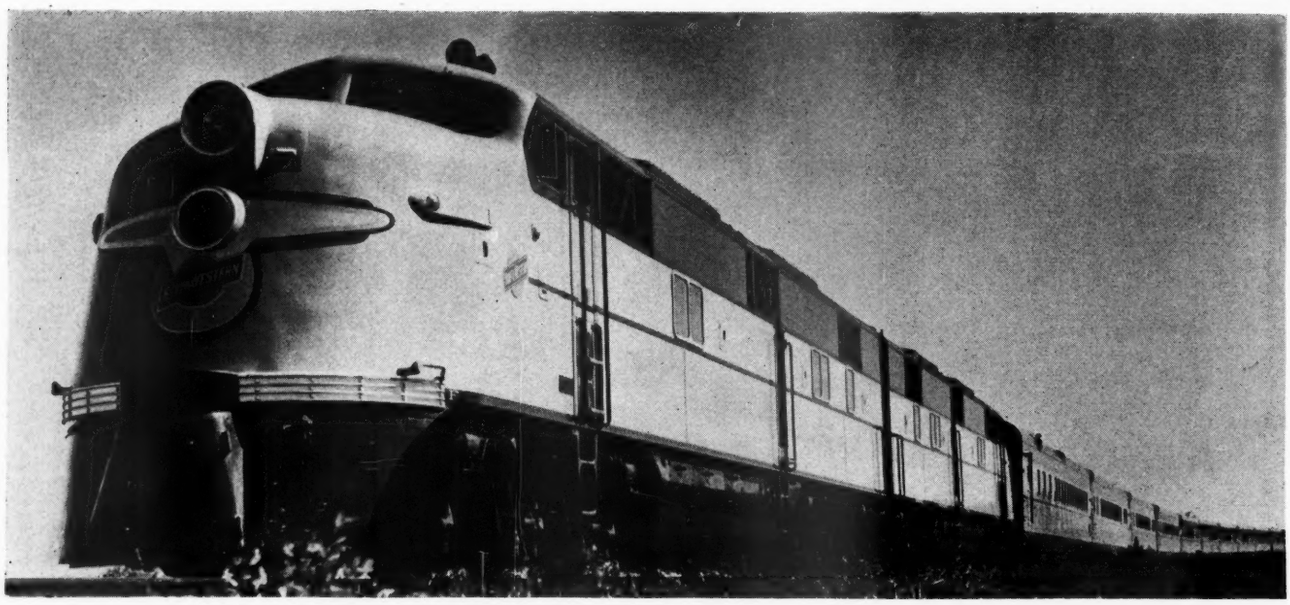
Steel Service Counter with Shelves, Desk and Waste Can for Store Operation on the Union Pacific



The "400" of the Chicago & North Western was Streamlined on September 24

Twenty New Streamliners in 1939

Faster schedules and greater comforts increase the convenience of modern rail transportation

TWENTY streamlined trains, presenting the latest refinements in travel comfort and passenger conveniences, were added to the already large list of luxury liners by the railroads in 1939, thereby bringing the total to 82 trains. With their colorful exteriors and even more colorful interiors, with pastel shades surmounting unique steel and wood panels, and improved lighting and other conveniences, these new trains add materially to the comfort of the traveling public. Of these 20 trains, 13 were placed in service in eastern and seven in western territory.

The railroads also improved their service during the year by the installation of more than 13 new trains of modernized equipment, some on streamlined schedules. Among these were the Asa Packer of the Lehigh Valley between Newark and Mauch Chunk, the St. Louisan of the Pennsylvania between St. Louis and New York, trains Nos. 1 and 2 of the Kansas City Southern between Kansas City and Shreveport, the Treasure Island of the Chicago & North Western-Union Pacific-Southern Pacific between Chicago and San Francisco, the Exposition Flyer of the Chicago, Burlington & Quincy-Denver & Rio Grande Western-Western Pacific between Chicago and San Francisco, the Trail Blazer of the Pennsylvania and the Pacemaker of the New York Central between Chicago and New York, and the latter's Mercury between Chicago and Cleveland. The Overnite Denverite of the Chicago, Burlington & Quincy and the Columbine of the Chicago & North Western-Union Pacific were placed in operation for the summer season to handle the overflow of business of the streamlined trains operated between Chicago and Denver. The Valley Flyer of the Atchison, Topeka & Santa Fe was operated also during the summer between Bakersfield and Oakland to handle the extra business created by the Golden Gate International Exposition.

Solid Coach Trains Inaugurated

Another significant development in 1939 was a further improvement in coach service, particularly in the eastern territory. Leading was the Seaboard Air Line, which early in February inaugurated the east's first deluxe chair car service between important cities. This New York-Florida train, the Silver Meteor, as well as the new lightweight trains added later in the year by the Seaboard Air Line, the Atlantic Coast Line and the Florida East Coast, provide lounge-buffet facilities, porter service, individual adjustable seats and low cost meals.

Also in the east, the Pennsylvania and the New York Central established solid coach trains, the Trail Blazer and the Pacemaker, between New York and Chicago. These trains, with similar luxurious facilities, operate on schedules of 17 hr., or only one hour slower than the first class extra fare trains of these railroads.

In the west, the Southern Pacific added to its fleet of economy trains by converting its Los Angeles-San Francisco Coaster into a coach-tourist sleeping car train with low cost meals. The Atchison, Topeka & Santa Fe added a dining car and three coaches to its Chicago-Los Angeles deluxe coach train, the El Capitan, and the Louisville & Nashville supplemented its regular dining car service with special service for coach passengers.

Still another important development in 1939 was the speeding up of trains generally. The most outstanding reductions in time were made between Chicago and Denver and were precipitated when the Chicago, Bur-

Lightweight Streamlined Trains Installed in 1939

For List of 62 Trains Installed 1934-38, see Railway Age of January 1, 1938, page 25 and January 7, 1939, page 21

Trains	Railroad	Between	Placed in Scheduled Service	Type of Motive Power	No. of Revenue Cars
Morning Hiawatha (2 trains) ..	C. M. St. P. & P.	Chicago-Twin Cities	Jan. 21	S.	9
Silver Meteor	S. A. L.	New York-Miami-St. Petersburg	Feb. 2	D.E.	7
General Pershing	C. B. & Q.	St. Louis-Kansas City	Apr. 30	D.E.	*4
Vulcan (2 trains)	Sou.	Chattanooga-Meridian	Aug. 24	D.E.	*2
Goldenrod	Sou.	Birmingham-Mobile	Sep. 24	D.E.	*2
"400" (2 trains)	C. & N. W.	Chicago-Twin Cities	Sep. 24	D.E.	10
Joe Wheeler	Sou.	Oakdale-Tuscumbia	Sep. 29	D.E.	*2
Cracker (2 trains)	Sou.	Atlanta-Brunswick	Oct. 11	D.E.	*2
Rocky Mt. Rocket (2 trains) ...	C. R. I. & P.	Chicago-Denver-Colorado Springs	Nov. 12	D.E.	10
Silver Meteor (2 trains)	S. A. L.	New York-Miami-St. Petersburg	Dec. 1	D.E.	7
Champion (2 trains)	A. C. L.	New York-Miami	Dec. 1	D.E.	7
Champion	F. E. C.	New York-Miami	Dec. 1	D.E.	7
Henry Flagler	F. E. C.	Jacksonville-Miami	Dec. 3	D.E.	7
		To Be Installed in 1940			
Eagle (2 trains)	M P.	St. Louis-Omaha		D.E.	6
Daylight (2 trains)	S. P.	San Francisco-Los Angeles		S.	14
City of Los Angeles	C. & N. W.-U. P.	Chicago-Los Angeles		D.E.	14
City of San Francisco	C. & N. W.-U P.-S. P	Chicago-San Francisco		D.E.	14
(2 trains)	C. N. S. & M.	Chicago-Milwaukee	June 1	E.	4

* Includes locomotive. E.—Electric.
D.E.—Diesel-electric. S.—Steam.

lington & Quincy, the Denver & Rio Grande Western and the Western Pacific placed the Exposition Flyer in service between Chicago and San Francisco on June 10 on a schedule of 59 hr. 55 min., with corresponding faster time to Denver of 20¾ hr. westbound and 18¾ hr. eastbound. On the same day, the Chicago-Denver schedules were further improved when the Overnite Denverite and the Columbine were placed in service between Chicago and Denver on schedules of 17 1/3 hr., and 7 hr. 59 min., between Chicago and Omaha. Eastbound, the Columbine's schedule was 19⅓ hr. from Denver to Chicago and 9 hr. from Omaha to Chicago, while the Burlington's Aristocrat was placed on the same schedule. Later in the year the Chicago, Rock Island & Pacific placed its Rocky Mountain Rockets in this service on a schedule of 19 hr. eastbound and 19½ hr. westbound.

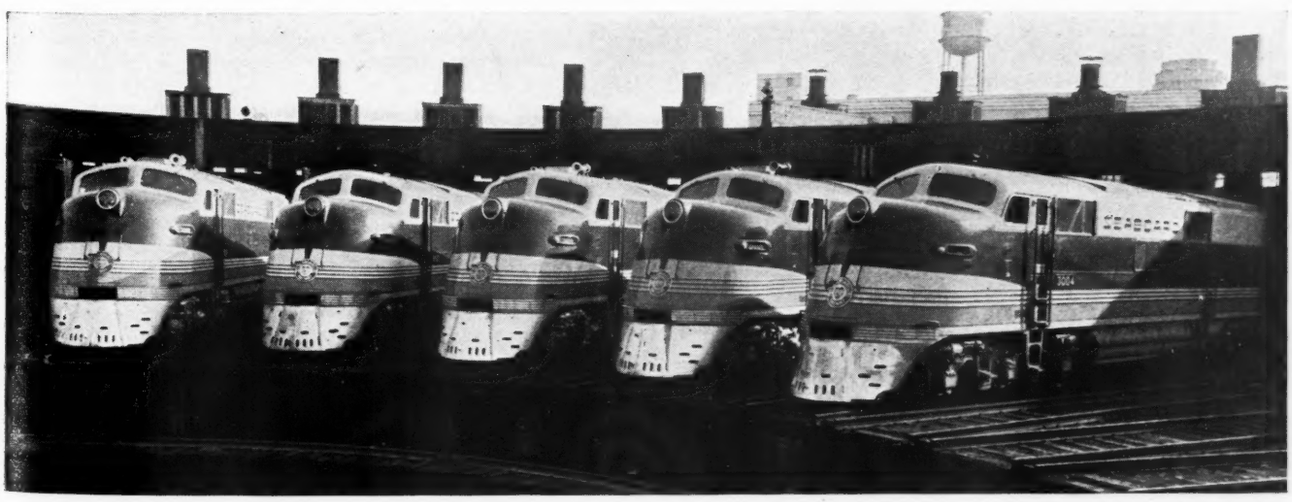
In other parts of the country there were also major changes in schedules. The Chicago, Burlington & Quincy further speeded up one of its Twin Cities Morning Zephyrs so that the train now covers the 431 miles between Chicago and St. Paul in 6¼ hr. instead of 6½ hr. and the 441 miles between Chicago and Minneapolis in 6¾ hr. instead of 7 hr. The Pennsylvania speeded up its Spirit of St. Louis, between St. Louis and New York, 35 min., thereby establishing the fast time of 20 hr. for the 1,052 miles. The Golden State Limited, operated by the Chicago, Rock Island & Pacific and the Southern Pacific between Chicago and Los Angeles, was speeded up 1 hr. 55 min. or to 59 hr. 10 min.

New York-Florida service, which has been materially speeded up during recent years, was made even faster in 1939, when the Seaboard Air Line, the Atlantic Coast Line and the Florida East Coast shortened the schedules of their trains. The present schedule of 25 hr. between New York and Miami is 1 hr. 5 min. shorter than the fastest time last year. Another outstanding reduction in running time is the two-hour cut in the schedule of the Cotton States Special, operated over the Pennsylvania, the Richmond, Fredericksburg & Potomac, the Seaboard Air Line, the Atlanta & West Point and the Louisville & Nashville from New York to New Orleans, La. The New York Central and the Pennsylvania adopted a schedule of 17 hr. westbound and 17 hr. 25 min. eastbound for their new coach trains between New York and Chicago.

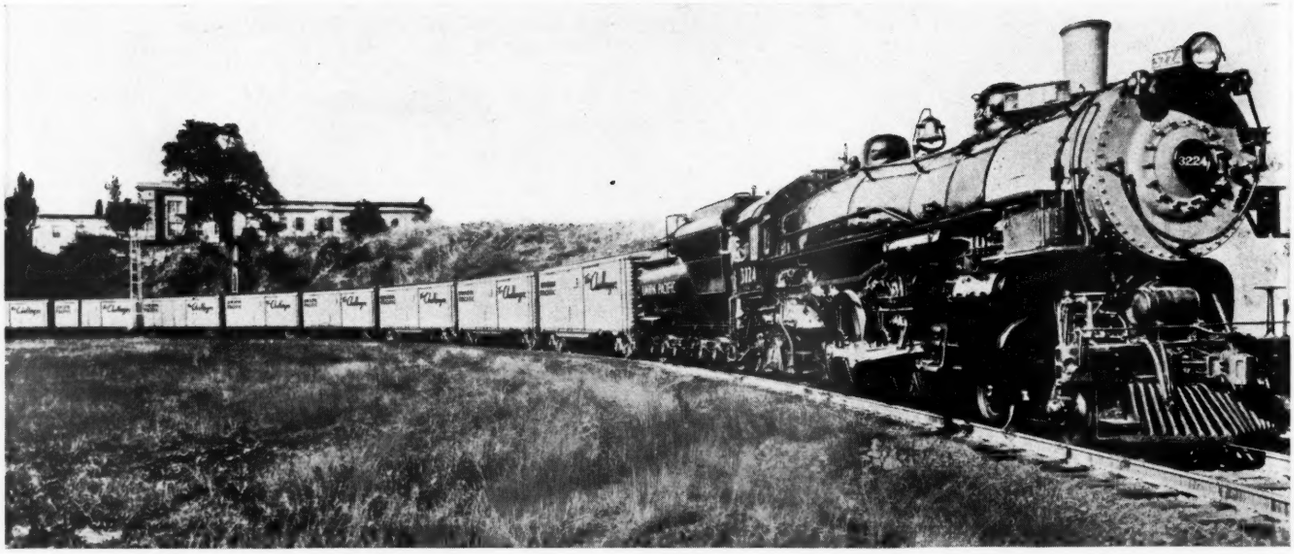
Lower Rates Established

An equally important development of the year was the initiation of reduced round-trip coach and sleeping

(*Continued on page 21*)



Streamlined Diesel-Electric Locomotives for the Seaboard Air Line's Florida Service



This Train Carries Merchandise Nearly Five Hundred Miles in One Night

Going to Town with Freight Trains

Last year marked by increasingly fast schedules and extension of first morning delivery zones

THE passing of the words "slow freight" from the railroad vocabulary was given added impetus during 1939 by the speeding up of many existing schedules and the inauguration of a number of new high-speed freight trains. The improvements in schedules that have been made in recent years have so enlarged the zones of first morning delivery from manufacturing and jobbing centers that overnight runs of 350 to 400 miles have now become common and next morning delivery to points as remote as 400 and 500 miles is being accomplished in several cases.

The largest installation of new high-speed freight trains during the year was that made by the Union Pacific, which established runs from Portland, Ore., to Boise, Idaho, from Salt Lake City to Idaho points, between Los Angeles and Salt Lake City, between Denver and Kansas City, and from Omaha west to the Colorado state line on schedules never before attempted. Of these the Portland-Boise overnight run of 491 miles is indicative, involving an overall average speed, including stops for set-outs, of about 40 m.p.h. for nearly 500 miles.

The "Whippet" on the Rutland, inaugurated in January, is identified in the public mind by means of advertising and by signs affixed to the locomotive and caboose. This train gives overnight service from Boston to points in northern Vermont and northeastern New York.

The St. Louis-San Francisco added the Dixie Flash, to its fleet of "Flashes" during the year, giving overnight service from Memphis to points in the Southeast, and the Texas Flash, providing second morning delivery from St. Louis to Dallas and Fort Worth. These additions, with the fast trains already in operation, give overnight service from St. Louis, Kansas City and Memphis to many points, at savings of as much as 24 to 36 hours in several instances.

The Southern Pacific added the Arizona Overnight to its fleet of merchandise trains, giving early first morning delivery from Los Angeles to Yuma, Ariz., and Phoenix, or to stations within a radius of 450 miles. In connection with this train, an extension of this fast service into Texas has been made.

On September 1, the New York, Ontaro & Western established the Pony Express, a fast merchandise train to give overnight service between New York City and points in northern New York; and on September 16, the Missouri-Kansas-Texas established fast freight trains that save a full day from St. Louis and Kansas City to many points in Texas.

In December, the Atchison, Topeka & Santa Fe accelerated its schedules from Chicago to Texas by 24 hr. involving the operation of a train from Chicago to Kansas City, 451 miles, overnight.

These new fast trains, selected geographically, are examples of the extent to which freight trains are being accelerated, and the service expedited. That the shipping public is responding to these improvements is illustrated by the operation of the M.S.1, of the Illinois Central, one of the pioneer, high-speed, solid merchandise trains. Although this train was originally set up to handle 25 to 30 cars, business has increased to the point that 75 to 80 cars are loaded nightly. Accordingly, it has now been split into two sections, one carrying merchandise for points between Chicago and Cairo, Ill., the other with traffic destined to the territory between Cairo and Memphis.

The new trains not only call for high speeds enroute, but for prompt and efficient terminal handling. This necessity is indicated by an analysis of the performance of Canadian Pacific No. 905 from Montreal to Toronto, 335 miles, one of the first of these trains to be placed in service. Merchandise for this train is loaded at the

Place Viger, Montreal, freighthouse up to 6:20 p. m. Other cars are then added and the train arrives at Outremont yard (part of the way up a 2 per cent grade) at 6:45 p. m. Here cars from five different yards are classified and put into the train, which leaves at 7 p. m. The first stop outside the Montreal district is at De Beaujeu, 40 miles from Montreal, at 8:05 p. m., where cars from Cornwall, Ont., are picked up. The train arrives at Smiths Falls, a division terminal 129 miles west of Montreal, at 10:40 p. m., and leaves at 11 p. m., after setting out cars for the freighthouse and for local trains and trucks, and picking up cars from Ottawa. The train arrives at Trenton, Ont., 103 miles further on at 2:05 a. m., and departs at 2:40 a. m., during which time cars for the freighthouse and local trains are set out and cars for Toronto are picked up. The next stop is at Leaside yard in Toronto, at 6 a. m.

This system of operation, with few stops and with prompt yard work where stops are made, is the basis for all these operations. It is only by expediting these trains through intermediate terminals and eliminating stops that the fast schedules can be made.

Proper Equipment

High-speed freight schedules also require first-class equipment. Several of the overnight merchandise trains started with the use of baggage cars, while others used freight cars with steel wheels. Still another idea was the assigning of equipment specifically to these runs. The Union Pacific has gone a step farther by having a fleet of 100 lightweight cars built specifically for fast service, some of which are equipped with roller bearings.

During the year several of the roads also equipped freight locomotives with roller bearings for high-speed service.

Recognizing this trend towards the design of equipment for this high speed service, the Association of American Railroads appropriated $45,000 for testing various types of trucks for high-speed freight service, and these tests were made during the last summer on cars equipped with glass floor plates to enable the action of the trucks at high speeds to be observed. These runs were made at speeds as high as 85 m.p.h.

The public is definitely demanding higher speeds in freight service today. The trains referred to above indicate the response of the railways to this type of service, a response that will extend more widely during this year. This service in turn is creating new problems for the mechanical and the engineering and maintenance of way departments, which these departments are already facing and solving.

Twenty New Streamliners in 1939

(*Continued from page 19*)

car rates in the East, which incorporate the principle of "The-further-you-go-the-less-you-pay-per-mile," and comprise the first application of the "decrease-as-distance-increases" scale to all points within one of the three major passenger territories. The basic round-trip coach rate in the East was reduced from 2.5 cents per mile to 2.25 per mile for distances up to 100 miles, and to an amount equal to 0.034 cents less for each 50-mile block thereafter, until a minimum of 1.7 cents per mile is reached for distances of 901 miles or more.

Similarly, the 3-cent per mile round trip rail rate applicable to lower berths and parlor cars now scales down to a minimum of 2.7 cents per mile at 901 miles. Also, the rail rate for upper berths was reduced from 3 cents to 2.7 cents, with the thought that this rate, which is slightly above the coach rate of 2.5 cents and a little below the lower berth rail rate of 3 cents, would encourage coach passengers to use upper berths. At the same time, round-trip rail rates for upper berths were scaled down from 2.7 cents to 2.43 cents at 901 miles.

Another interesting rate reduction in 1939 was the "Grand Circle" fare that was offered to stimulate travel to the two World's Fairs. For $90 an individual could travel by coach from any point in the United States to either New York or San Francisco, then cross the continent to the other city and return to the starting point, a complete tour of the United States with stop-over privileges. First-class tickets for the "Grand Circle" tour were reduced to $135, plus special Pullman rates of $45 for a lower berth and $34.50 for an upper.

Summary

The developments in 1939 have carried forward the trend toward a continued increase in train speeds and corresponding improvements in all facilities. At the same time, improved accommodations have become a corollary of faster schedules.

The public demands improved passenger service, and the railroads are keeping pace with its command. Eight new trains are being built at the present time and will be placed in service in 1940, while still others will be ordered and constructed in this year. Indicative of this trend is the action of the Colorado & Southern and its subsidiary, the Fort Worth & Denver City, which, during the closing weeks of 1939, applied to the Reconstruction Finance Corporation for loans with which to finance the purchase of two streamlined trains which will be operated between Fort Worth, Texas, and Denver, Colorado.

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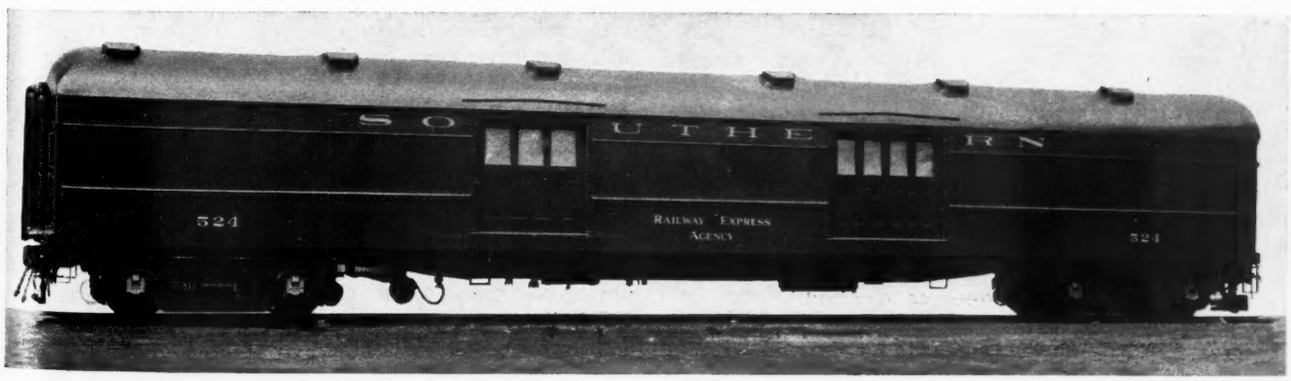
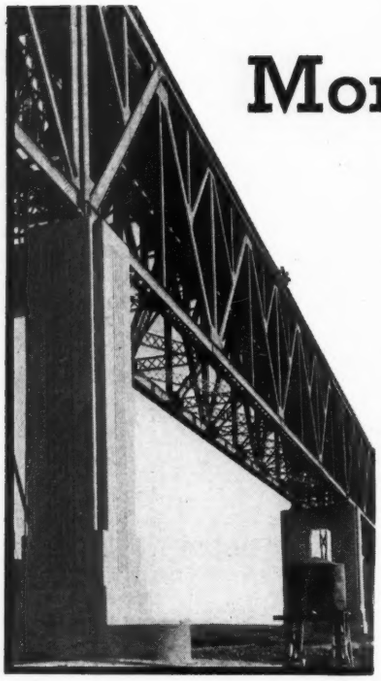
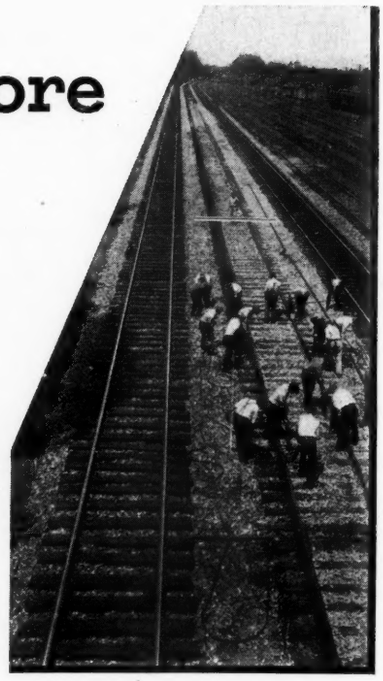


Baggage-Express Car for the Southern. Light Weight 115,000 Lb. Length of Body End Posts, 70 Ft. 9 In. Builder, Bethlehem Steel Co.

More Traffic—More Construction and Maintenance



New Rock Island Bridge Over the Cimarron River in Southwestern Kansas



Higher Speeds Demand Greater Refinement in Track Line and Surface

This article, based on a review of the construction and maintenance activities of the railways of the United States since 1925, and the radical changes that have been made in operating methods, shows that, allowing for the decrease in traffic during the depression years, the increased life of materials and the greater efficiency of performing work, the railways are in need of many new and improved facilities and must spend more for maintenance to keep pace with increased traffic and the demands for improved service.

THE need for new and revised facilities, as well as for the more intensive maintenance of their existing properties, create a pressing problem for the railways, a problem which now takes on increased significance as they have just come through a year which closed with an abnormally large increase in traffic, and are entering a year that promises greater demands on railway facilities than have been experienced in any year since the beginning of the depression. Facing these facts, railway engineering and maintenance officers are taking stock of their tracks, bridges, buildings and water service facilities to a degree that they have not done during the last decade, not only with new hope that additional work *can* be undertaken during 1940, but with the realization that much of this work *must* be undertaken if the tracks and other units of fixed property are not to present an obstacle to the determination of the railways to meet all demands which may be made on them, and to increase further the speed and attractiveness of train travel and the efficiency and economy of train operation.

The conditions that confront engineering and maintenance of way officers in this regard extend to practically every element of the fixed property, including main tracks, yards, sidings and passing tracks, many types of railway buildings, bridges, and engine terminal facilities, and water pumping, treating, storing and delivery equipment. They extend also to every method of carrying out the upkeep of these facilities, not alone to insure that their maintenance, the cost of which runs into hundreds of millions of dollars annually under even the most favorable conditions, will be done effectively and with the greatest economy, but also to insure that it will be carried out with the least possible interference with train operation.

Many New Facilities Needed

One of the outstanding characteristics of the railway industry in years past has been the magnitude of its construction activities, both as regards the number of projects undertaken and their size. That this activity has been much less outstanding since the full force of the depression set in is evidenced clearly in the fact that whereas the annual gross expenditures of the Class I railways of the country for additions and betterments to their fixed properties (not net additions) averaged $461,848,250 in the years 1923 to 1930, inclusive, annual expenditures for these same purposes have averaged only $147,016,125 in the years 1931 to 1938, inclusive, or only approximately one-third as much. Furthermore, the limited expenditures of recent years, with few exceptions, have embraced projects of limited scope, insufficient funds being available to carry out the many large projects contemplated by the railways in the interest of better service and economy.

It is true that both passenger and freight traffic were off sharply during the latter period, which reduced the drain on many units of fixed property, but far offsetting this factor is the fact that during this same period operating methods have changed more radically than during any equal period since the beginning of the railways, these changes rendering thousands of otherwise satisfactory facilities inadequate, obsolete or out of place. Because of this trend, the railways have fallen far behind their needs for modernized facilities, and

these needs are growing as the changes necessitated by improved service and greater economies in operation are growing and expanding. That increased traffic in 1940 will add further to these needs, is obvious. Furthermore, it is equally evident that the continued use by the railways of many of their inadequate or obsolete facilities will place a serious obstacle in their program for higher speeds and improved service, and serious restrictions upon the goals of increased efficiency and economy of operation toward which they are striving.

One of the most important outmoding influences upon the present fixed properties of the railways is the public demand for speed, which, directly or indirectly, affects almost every element of the track structure as to both design and layout. In the first place, the operation of passenger trains and of heavily-loaded freight trains at higher speeds requires a stronger track structure, including heavier rail and fastenings, increased depth of ballast, and a higher tie standard, and along with this a greater degree of refinement in practically every phase of track maintenance, especially line and surface. With increases in speed come also the necessity for revisions in alignment to reduce or eliminate curvature, a problem which has been met by those roads that have inaugurated high-speed passenger train service, and that will confront other roads as this class of service is extended.

Sidings and Yards

Along with the changes required in main-line tracks to permit faster train operation is the effect of such operation upon passing sidings, yard layouts and turnout construction. Obviously, such operation does not permit the delays of stop-and-wait meets in single-track territory. This has brought to the fore centralized traffic control, with its power operation of all switches, longer turnouts to permit higher speeds through them, and the respacing and lengthening of sidings. It also requires that the sidings affected be constructed and maintained to higher standards than formerly, and that they be longer to permit meeting and passing movements without stopping.

Furthermore, yard facilities at terminals and intermediate points, in general, comprise one of the most serious obstacles to expedited freight train service. While many improvements have been made in equipment, and especially in power, to keep freight moving over the line, inadequate revenues have made it impossible to bring about those changes at many yards and terminals which are conducive, if not essential, to the expeditious handling of cars at these points, comparable with the expedited road movements and the still greater road haul speeds which are contemplated.

Among the principal needs at yards are the rearrangement of tracks to meet the new operating requirements, new or revised humps, the installation of car retarders and power-operated switch movements, improved yard lighting, modern communication systems, pneumatic messenger service, and the relocation and rearrangement of yard office facilities. All of these improvements have demonstrated their importance and ability in expediting the handling of cars through terminals, and their more widespread adoption awaits only the return of adequate revenues to the railways, with the funds for improvements which this will make possible.

With these major improvements necessary in track and yard facilities must come many changes and improvements in fuel and water stations if service delays are to be cut to a minimum, if schedules are to be further shortened, and if the problems of locomotive maintenance, as affected by the quality of the boiler water, are to be minimized. Furthermore, in view of the relatively few fuel and water stations that have been built in recent years, and the marked developments which have taken place in coal and water-handling facilities, it is essential that many existing facilities be modernized to increase their dependability and their efficiency of operation.

With the longer locomotive runs, larger engine tanks and faster schedules that are inherent in modern operation, many water stations that were once of primary importance are now passed up by important trains and are required only for intermittent use, if at all. At the same time, other stations are becoming principal water stops and must be provided with new pumping and power units, new service tanks of greater capacity, and means for the faster delivery of water to locomotives. To bring about these conditions at hundreds of points on the railways awaits no realization of their importance on the part of engineering and operating officers, because they know that the fast train service of today does not allow for unnecessary stops, the special routing of trains or locomotives to reach fuel and water stations, and slow or ineffective delivery. Such improvements have already been made at some points, and only the lack of available funds has restricted their construction at many other points.

Coupled with the essential improvements already mentioned, the railways are being forced to give increased attention to their buildings to meet changing operating conditions or service requirements, or the demands of the public for facilities in keeping with the marked improvements which are being made in passenger train accommodations and service. Outstanding among those buildings requiring attention are passenger stations, which, except in relatively few instances, have been neglected during the depression while such funds as were available have been devoted to those facilities affecting the efficiency and safety of train operation. No one will deny that through this enforced neglect many stations are now not only out of keeping with the improvements that are being made in passenger service, but are largely unfit for the purpose for which they are being used. Many of these stations will have to be replaced, but many more of them can be remodeled and modernized most effectively, and at relatively small cost as compared with complete rebuilding, as is evidenced by the number of effective passenger station renovation projects that have been carried out during the last two or three years, taking advantage of the extensive developments in building materials and equipment.

Behind in Maintenance

Supplementing the large need for the modernization of their fixed properties to meet the demands for better service and more expeditious and economical train operation, the railways must look seriously to a higher standard of maintenance of these properties. At the outset of the depression in 1929, as the result of plowing millions of dollars of earnings back into their properties, the physical condition of the railways was at its peak, whereas following ten years of greatly restricted earnings and seriously curtailed expenditures for the maintenance of way and structures, the physical condition of the railways at the beginning of 1940, including many miles of main-line tracks and many important structures, is at a definitely lower ebb.

To substantiate this contention, one need only look

at the records of the expenditures which have been made for maintenance of way and structures over the last 15 years. During the five years ending with 1929, these expenditures by the Class I railways of the United States (excluding switching and terminal companies) averaged $849,020,923 annually, whereas in the nine years from 1931 to 1939, inclusive, the annual expenditures of these same roads averaged only approximately $422,000,000. These figures show that, during the last nine years, the railways have spent less than 50 per cent as much annually to maintain their fixed properties as they spent during the earlier period.

What does this mean? Obviously, these figures indicate a much greater accumulation of deferred maintenance than actually exists, because of the reduced volume of traffic and the resulting lessened wear and tear on the properties during the latter period. But allowing generously for this reduction in traffic, and also for the increased life which is being secured from track materials through the use of heavier rails, the welding and heat treating of rail ends, improved joint fastenings, larger tie plates and treated ties, as well as for the marked advances that have been made in the efficiency with which work is being performed through the use of specialized organization and the wider use of power machines and tools, it is evident that the accrued deficiency in the maintenance of the tracks and fixed structures of the railways is large. In fact, after taking into account all of the more tangible elements and making generous deductions for those of a less tangible character, it is estimated that the deficiency that has accrued in maintenance to the present time amounts to more than a billion dollars, an amount equal to more than that spent by the railways for the maintenance of their tracks and structures in any two years since 1930.

Some indication of the extent to which this aggregate deficiency is distributed among the various elements of the fixed property is afforded by the accompanying table giving the break-down of maintenance expenditures between 1931 and 1938, inclusive, compared with the corresponding average expenditures from 1925 to 1929, inclusive.

Expenditures for Maintenance of Way and Structures, Class I Railways

(Thousands)

	Average 1925-1929 (Inclusive)	1931	1932	1933	1934	1935	1936	1937	1938
Superintendence	$57,262	$49,324	$36,552	$31,921	$33,347	$35,605	$37,357	$39,801	$38,935
Roadway Maintenance	83,698	48,575	32,042	30,026	30,714	35,809	38,289	42,017	37,219
Tunnels	2,608	1,774	1,466	933	1,051	1,453	1,326	1,709	1,256
Bridges, Culverts, etc.	43,471	28,123	19,434	17,627	20,139	22,646	24,032	26,268	24,200
Ties	114,859	72,651	50,294	43,543	50,748	51,936	56,315	59,799	53,762
Rails	47,402	25,960	13,762	14,324	15,418	16,302	21,192	20,412	17,406
Other Track Materials	48,354	26,505	15,726	15,362	18,694	20,959	26,732	30,228	22,817
Ballast	19,379	8,601	4,969	5,814	7,538	8,357	11,992	12,362	7,744
Track Laying and Surfacing	211,067	131,274	83,407	77,025	85,641	94,033	106,072	121,113	103,420
Fences and Snow Sheds	5,831	3,119	2,135	2,047	2,412	2,260	†3,397	†3,689	†2,939
Crossings and Signs	13,115	9,656	6,468	5,969	7,293	7,186	*	*	*
Buildings	79,000	42,539	24,924	24,576	31,448	33,047	41,252	47,757	34,315
Water Supply	10,444	6,299	3,952	3,749	4,441	4,497	5,860	6,182	4,672
Tools and Equipment	18,230	11,834	7,917	8,051	10,666	11,044	13,452	15,408	11,456
Injuries	5,907	3,941	2,811	2,417	2,810	2,727	3,118	3,303	2,806
Removing Snow, Ice and Sand	9,947	4,343	4,699	4,188	5,630	7,001	13,365	6,655	5,239
Miscellaneous	78,449	56,095	40,621	34,714	37,310	39,105	51,059	58,891	51,961
	$849,021	$530,613	$351,179	$322,286	$365,300	$393,967	$454,810	$495,594	$420,147

Note: Miscellaneous includes signals and interlocking, all charges for depreciation and unclassified items.
* Not shown separately since 1935.
† Includes, signs, as well as fences and snow sheds.

Rail and Tie Renewals

While quantitative determination of the accrued deficiency in expenditures for individual items, as shown in the table, presents practical difficulties, an analysis of two of the major items, rail and ties, can be made with some degree of accuracy. Even here, however, due allowance must be made for the practices which have been developed for prolonging the service life of rail through welding, heat treating and grinding, and the increased life of ties which has been effected as a result of better protection against mechanical destruction through the use of larger tie plates, and against decay through the wider use of preservative treatment.

The amount of rail laid by the Class I roads from 1925 to 1939, inclusive, measured in tons, is shown in another of the accompanying tables. From this table it is noted that while the amount of rail laid in 1939, estimated at approximately 850,000 gross tons, showed a sharp increase over that laid in 1938, it was still less than one-half the amount of rail laid annually in the years 1925 to 1931, inclusive.

As regards tie renewals, it can be seen from another of the accompanying tables that the Class I roads inserted approximately 44,000,000 ties in 1939. This represented an increase in the renewals over those in 1938, but it was at least three million fewer than the renewals made in both 1936 and 1937, and was only about 56 per cent as many ties as were inserted in tracks annually between 1925 and 1929, inclusive, when tie renewals averaged 78,770,446. In view of these figures, and giving due consideration to all of the factors which have contributed to the increased life of ties in recent years, it appears that at the end of 1939 there was still an accumulated deficiency in tie renewals of at least 90,000,000 ties.

Rail Applied in Renewal—Class I Roads

	Gross Tons		Gross Tons
1925	1,950,146	1932	394,536
1926	2,209,873	1933	403,254
1927	2,124,765	1934	631,093
1928	2,080,277	1935	582,794
1929	1,958,489	1936	921,298
1930	1,517,002	1937	1,029,861
1931	984,900	1938	599,752
		1939	850,000*

* Estimated.

While the large amount of deferred maintenance indicated on the railways is widely distributed, it is a fact that many classes of facilities have been affected much more seriously than others, and that minimum

evidence of retrenchment is seen in high-speed, main-line tracks. With the advent of higher speeds of both passenger and freight trains on these tracks, the increased demand for smoother riding, and the ever-present demand for safety of operation, maintenance of way officers have been compelled to spend increasing proportions of the funds available to them for the maintenance of their high-speed tracks, at the expense of other elements of their properties where the factor of safety and public opinion are not involved or are less vital. This, of course, is as it should have been, and yet every railway officer realizes that there is a limit beyond which this practice cannot be continued, and that with an upturn in traffic and earnings, this practice must be modified materially.

Crossties Applied in Renewals—Class I Roads

1925	82,716,674	1932	39,190,473
1926	80,745,509	1933	37,295,716
1927	78,340,182	1934	43,306,205
1928	77,370,491	1935	44,351,900
1929	74,679,375	1936	47,361,015
1930	63,353,828	1937	47,729,538
1931	51,501,659	1938	41,363,224
		1939	44,000,000*

* Estimated.

Mechanical Equipment to the Rescue

The fact that the railway properties have been maintained to the standards that they have, with their still enviable safety record, in spite of the generally increased tempo of railway operation, is a tribute to every engineering and maintenance of way man. During the early years of the depression, with their drastic reductions in revenue and resulting allotments for maintenance of way and structures work, many maintenance of way men feared dire consequences to the safety of train operation if the situation was to be prolonged, but in a very remarkable way they have met the challenge and have stretched the maintenance dollar to a point unthought of prior to the depression. While this was brought about in many ways, one of the most outstanding has been through the more widespread and extensive use of power tools and work equipment for carrying out all classes of maintenance work.

While a limited number of types of power tools and work equipment were available for maintenance of way work prior to 1920, it was not until the relative boom period from 1922 to 1930 that their full possibilities for reducing the arduous character of many classes of work, while improving the quality of the work and at the same time effecting substantial economies, as well as speeding up the completion of programs, became fully evident and the use of such equipment became widespread. With the onset of the depression, all of these advantages obtainable through the use of equipment became increasingly important, a fact which was further emphasized by the increase in the wage scale of approximately 15 per cent, made late in 1937. Obviously, the higher the wage scale, the greater is the economy in employing work equipment. This was demonstrated clearly following the increase in wages referred to previously, which immediately brought to the fore some machines that could not be justified previously on grounds of economy, and at the same time added greatly to the incentive for further development and expansion in the use of power machines and tools for maintenance of way and structures work.

So important has been the contribution of all classes of work equipment to the efforts of the maintenance of way and structures forces that there is no question but that without this equipment the operations of these forces would have been seriously affected throughout the depression years, with definite reflection upon the condition of the fixed property. In fact, so great has been the effect of many types of equipment upon methods of carrying out maintenance work that it is doubtful if much of this work could today be carried out at all if it became necessary to return to hand methods.

Outstanding among this equipment is the motor car, which has eliminated the arduous task of pumping hand cars, delivers the men fresh on their work, shortens the time going to and from work, and greatly increases the mobility of the forces generally. Likewise, the tie tamper has reduced the drudgery of a difficult task at best, and, in addition, produces more uniform work of greater permanence at a cost less than that of hand work. Similarly, the tie adzer conserves time, does more accurate work, reduces the hazard of personal injuries and conserves the life of ties. Spike pullers, spike drivers, bolt tighteners, power drills, rail grinders and other machines and tools are demonstrating the same characteristics of economy, speed and safety that are so essential today in maintenance of way work. The same can be said of many types of work equipment being employed by bridge and building forces, including cranes, pile drivers, air compressors, electric generators, paint sprays, power saws, wood borers, power wrenches, power trench pumps, etc.

Large Investment in Equipment

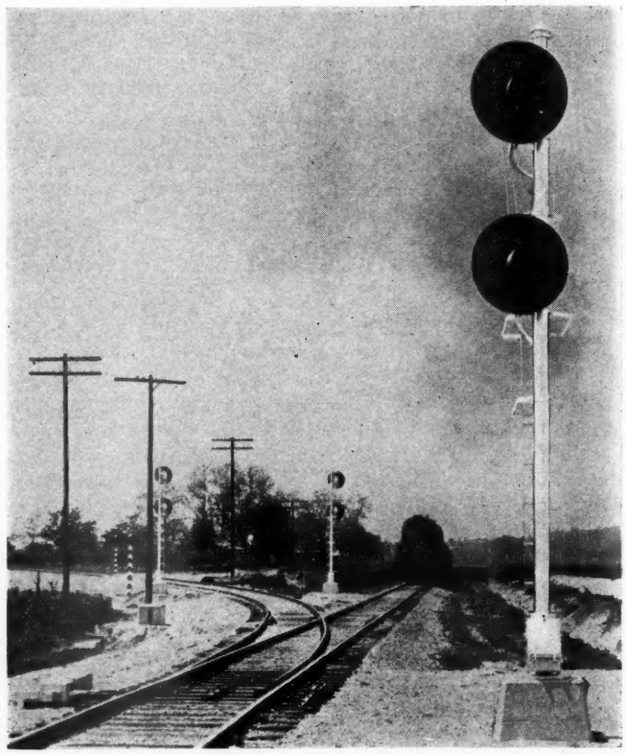
That the railways are convinced of the economy and other advantages of work equipment for carrying out maintenance of way and structures work is evidenced in the fact that they have invested more than $100,000,000 in this type of equipment and are continuing to purchase additional units to the extent that their resources will permit. Spurred by increased earnings early in 1937, the roads purchased more than 3,300 units of new equipment during that year, involving a total outlay of more than $5,000,000, and, in spite of the sharp decline in traffic in the latter part of 1937, and the continued low level of earnings during 1938, they purchased more than 1,200 units during 1938. Again stimulated by the somewhat better conditions prevailing during the first nine months of 1939, they purchased another 3,500 units last year.

No longer can the maintenance forces afford to use the obsolete steam shovel where faster, more flexible and more efficient shovels are available. Neither can they afford to continue the use of certain types of rail-bound equipment, whose cost of operation is being burdened by the successful efforts of the train-service brotherhoods to place their members on this equipment as a "make work" measure. Nor can they afford to continue to operate many of their older heavy section motor cars, which have been rendered obsolete and a hazard to the track forces as the result of the general reduction in size of section gangs. And the same can be said of many of the old units of power tamping equipment, which, today, in the light of improvements which have been made in power units and in the tamping tools themselves, are highly inefficient.

A fuller realization of these conditions, supplemented by increased demands for quality work, greater efficiency, and the prospects for increased earnings during 1940, all point to extensive purchases of a wide variety of power tools and work equipment in the months immediately ahead.

Signaling Faces New Demands

Replacements to meet modern train operating conditions—New equipment solves performance problems—I. C. C. requirements to be met



Centralized Traffic Control Saves Train Time at Junctions and Passing Tracks

A REVIEW of signaling developments during 1939 indicates that 1940 will present important problems incident to the improvement, operation, and maintenance of signaling facilities, dealing specifically with (1) the construction of new signaling and the rehabilitation of that now in service to meet more fully the requirements of present-day train operation, (2) the utilization of new systems and apparatus to improve signaling performance and thus reduce the number of unnecessary train stops as well as minimize maintenance and operating costs, and (3) the organization of signal forces to meet the requirements of the new signaling rules, standards and instructions of the Interstate Commerce Commission, without incurring excessive charges or inaugurating complicated record and filing systems.

Signaling for To-day's Train Operation

Shortened schedules for both passenger and freight trains, which were inaugurated during the years of light traffic, must be maintained and perhaps further improved, with on-time performance, in spite of the fact that increases in the number of trains due to better business will introduce further interference between trains. Efficiency dictates that train performance be maintained and improved by utilizing existing locomotives and tracks to maximum capacity, and the most logical method of reducing over-all time of trains between termini is to minimize the number of unnecessary train stops and delays. Modern signaling is peculiarly adapted to effect these results in many instances.

On certain single-track lines on which additional fast trains had been introduced, it became evident during the period of peak traffic in 1939 that scheduled freight trains were suffering serious delays on the territories where other trains met and passed these freight trains. One logical solution for such a problem, which was followed on several projects during the last year and is proposed for others in 1940, is to furnish centralized traffic control, which will minimize delays and thereby reduce the over-all time of freight trains about 1.2 min. per mile. On certain sections of double track, the introduction of fast scheduled trains has resulted in serious delays to slower trains which are required to enter sidings to let the other trains pass. Under such circumstances, one road now proposes to install centralized traffic control for either-direction operation on both tracks on a 160-mile territory, by means of which faster trains can be run around the slower ones, and still keep all trains moving with safety.

On some double-track lines, where traffic conditions have changed during recent years and new freight locomotives haul longer trains at higher speeds, further study has been given to the matter of removing sections of second track between portions left as passing tracks. The practicability of efficient train operation on the one track remaining is made possible by the use of centralized traffic control including power-operated switches and signals for directing train movements, thus eliminating the unnecessary delays inherent with time-table and train order operation.

If the sidings are spaced on a time-distance basis and are adequate in length, very little train time need be lost in making meets as compared with ordinary double-track operation. Furthermore, much less time is wasted in making passes as compared with double track where hand operated switches are used and train movements are governed by time-tables and train orders. During the last few years, one road removed extended sections of second track, leaving portions as passing tracks, and during 1939 another road removed eight miles of second track as a trial, looking to an extensive program of this character in which sections of second track would be used normally in right-hand running.

The amount of time lost in reducing speed to a low limit and then again accelerating to normal speed varies roughly with the square of the differences in speed; thus as train speeds are increased generally, this time loss mounts rapidly. In many instances, speed limits can be raised by changing crossovers and turnouts at

less expense than comparable results can be effected by reductions of curvature elsewhere. During 1939, much study was given to the reconstruction of turnouts to permit increased speeds up to 50 m.p.h, while one road, by means of a special track arrangement, operates trains over turnouts at an end-of-double-track layout at a maximum authorized speed of 70 m.p.h.

One of the most evident inconsistencies in railroading is to "run the wheels off of freight trains" to get them over a division, and then waste hours in receiving yards, in classifying the cars and in dispatching them in trains again. By rearranging tracks and installing power switches and car retarders, incoming trains can be pulled in on tracks leading to humps, while classification tracks can be made long enough to hold entire trains so they can depart directly from these tracks. The power switches and retarders insure maximum yard-operating capacity at all hours, with a minimum number of employees. Through these means, from 40 min. to an hour or more is saved in the yard time of cars, and the savings in operating expenses thus effected represent a high return on the investment for new facilities.

New Signaling Apparatus

During 1939, rapid progress was made in the development and installation of code control automatic signaling apparatus, by means of which the controls for four or more aspects displayed by a signal are handled over the track itself, rather than using line wires for some of the controls. The elimination of line control circuits obviates signal failures caused by lightning, as well as breaks and crosses of line wires. Within recent months, d-c. code equipment has been developed to the point where it can be operated efficiently from local battery supply, thus further minimizing the likelihood of interruptions caused by lightning. Another advantage of this d-c. track code control for wayside automatic block signaling is that track circuits up to 15,000 ft. in length can be operated successfully, whereas three or more ordinary d-c. track circuits would be required in blocks of this length.

On much of the older automatic signaling territory, the signals should be respaced and new signals installed to provide block lengths and aspects in accordance with braking distances of modern high-speed trains. The Chicago & North Western completed a change-over of this nature during 1938, while more extensive programs on the New York Central between Vickers, Ohio, and Cleveland, and on the Norfolk & Western between Petersburg, Va., and Norfolk are under way.

Rather than reconstruct and move a lot of antiquated apparatus, some roads are installing new equipment throughout, including code control apparatus, which will pay for itself in reduced maintenance and operating expenses, and, furthermore, will result in fewer train delays caused by signal failures resulting from defects. Two extensive projects of this nature are now under way and at least two others are proposed. One road is now installing the d-c. track control system for cab signaling without wayside signals and without automatic train control; being the first installation of this character, it will be watched with interest.

Tests made recently have proved that the coded line controls used in centralized traffic control systems can be superimposed on existing telephone train dispatching wires without interfering with the telephone conversations. This increases the practicability of applying power switches and signals at outlying switches as well as centralized traffic control on entire districts.

Conflicting opinions have been expressed recently as to whether the vast majority of the single-track signaling now in service conforms with certain of the new I.C.C. requirements with respect to the arrival of trains at signals displaying the Stop aspect without previously having encountered signals displaying Approach. One railroad has developed and installed a system of control with four aspects which is said to obviate any probable conflict with the I.C.C. requirements. Regardless of whether the contentions have merit insofar as safety or efficiency of track capacity are involved, development is under way to devise simple and economical systems of automatic-manual control, by means of which the station-leaving and station-entering signals can be controlled normally from a central point, thus permitting the direction of train movements by signal indication without train orders, which would include the advantages of centralized traffic control except for the power operation of switches, and this could be added at various locations as needed. A point of importance is that, on practically all new automatic signaling planned for single track, the signals in the vicinity of switches should be located as required for centralized traffic control so that no expensive changes need be made when installing C.T.C. at a later date.

I. C. C. Tests and Inspections

All new signaling projects, as well as major changes or improvements, must now be made in accordance with the rules, standards and instructions of the I.C.C. An application must be made and official approval received from the Commission for every project of major importance. A period of two years from September 1, 1939, is allowed in which to change existing signaling to conform with the requirements. Roads faced with so many changes that they cannot logically be completed within the two-year period, might well show considerable activity in getting started at once as proof of good faith before requesting the Commission for extensions of time.

Another phase of the I.C.C. requirements involves inspections and tests at certain intervals, an important consideration in which is the stipulation that records of the results of these inspections and tests must be kept. Whether the expense of making all of these tests at the frequencies required can be justified by improved safety in the form of reductions in the number of false clear signals, remains to be seen. Nevertheless, the tests must be made, and one benefit which should be derived on many roads is a reduction in the number of train delays caused by signals displaying Stop aspects due to improper maintenance. If the performance of signaling does not improve, it will be evident either that signaling construction and maintenance were nearly perfect previously or that the field forces are still "shooting trouble," rather than detecting and correcting defects before they cause failures, as should be possible with the new systems of inspection.

Considerable thought is required to devise efficient methods of testing that will not result in more train delays than are obviated by not testing. Study must also be given to the organization of a simple method of recording results whereby a minimum of book work is required in the field and a minimum of compilations and filing in the office, otherwise the railroads are going to be saddled with an ever-increasing operating expense that will not be justified by the results obtained.

Thus in conclusion, it is evident that the adaptation of modern signaling to meet new train operating conditions and the new government regulations, has introduced many new problems with reference to railroad signaling which must be given serious study during 1940.

Electrical Benchmarks

ELECTRICAL developments of the past year include many having railroad application. Those which will, apparently, have the most influence on future railroad work are covered in the following summary.

Shop Equipment

Applications of alternating-current welding have been extended by the introduction of new power supply apparatus and welding controls. In some cases a. c. welding is done with current as low as 20 amp. and large a. c. current transformer type welders are operated to produce current ranges from 200 to 4800 amp. for multiple-operator welding. Improvements in automatically-controlled resistance welding have speeded up operations in car building. Welding recorders have been produced which automatically sound an alarm if a spot weld is faulty.

A new variable voltage drive for reversing planers offers the advantages of wide speed range for extremely fast acceleration and deceleration and simplicity of control.

The current supply to electric annealing and tempering furnaces can now be controlled without cycling, by means of a saturated reactor control. Alternating-current crane and hoist motors can now be had which will accurately control the load, and which will reduce the need for direct current in the railroad shop.

The radiant energy produced by "infra-red" incandescent lamps has been substituted for steam coils for drying lacquer. Time for drying was reduced from 30 minutes to 7.

For some time the Illinois Central has carried on an intensive program of power-factor correction, particular attention being given to locations where the use of static condensors will materially reduce penalty charges. The average return on investment for five installations is 65.8 per cent (Railway Electrical Engineer, April, 1939, page 72).

Series capacitors have been introduced for power-factor correction of resistance welding machines. The capacitors also improve line regulation and reduce interference between welders.

The Pennsylvania, with its engine terminal for steam and electric locomotives at Harrisburg, Pa., has shown the practicability of operating an enginehouse without a power plant. Steam and water, as well as electrical energy, are purchased. Locomotives are fired with induced draft blowers, the steam being used only for the heating of buildings and locomotive washwater.

Electric Traction

New capabilities of electric traction have been realized on the Pennsylvania by the development of improved operating methods (*Railway Age,* September 23, 1939, page 440). The result has been improved schedules, better train loading and increased locomotive mileage.

While making studies of electric traction requirements, engineers discovered that trains hauled by locomotives on the Pennsylvania showed a resistance which was 25 per cent below the calculated figure. Not more than a 10 per cent reduction can be accounted for by stiffer track used on the electrified lines.

An Ignitron-type rectifier for changing alternating-current power to direct-current for traction purposes was installed by the New York Central. This type of rectifier with one anode and one cathode in each vacuum-tight steel tube should minimize momentary shutdowns due to arc-backs and improve flexibility of operation.

Twenty type GG-1 electric locomotives are now under construction at Altoona for the Pennsylvania, and four high-speed passenger locomotives, recently completed for the Paulista Railways of Brazil, will early this year be added to that railroad's present fleet of 30 freight, passenger and switching locomotives.

Train Power Supply

All electrical power requirements for a 20-car train, including heating, air conditioning, lighting, cooking and auxiliary services, were calculated in a study by E. M. Bill and F. L. Sahlmann, transportation department, General Electric Company, which appeared in the May, 1939, issue of Railway Electrical Engineer, page 94.

The present status of standby power facilities for railway passenger cars has been compiled by the Committee on Power Supply, Electrical Section Engineering Division IV, A. A. R., and appears in its 1939 report.

An innovation in standby power facilities, in the form of a rolling substation, was designed by the Baltimore & Ohio primarily for servicing parked Pullman cars (Railway Electrical Engineer, September, 1939, page 175).

Fluorescent Lighting

Illumination values of from 7 to 15 foot-candles are now recommended by railroad lighting engineers for passenger cars. This compares with values of from 1 to 5 in older equipment. These values are now obtained effectively and artistically with incandescent light. With fluorescent light they are obtained with relatively little power consumption.

Fluorescent lighting for passenger cars, introduced in 1938 by the New York Central, is now standard on the Lehigh Valley, and has been applied to cars in service on the Seaboard, Atlantic Coast Line, Florida East Coast, Chicago & North Western and Chicago, Burlington & Quincy, the latter having one train—the "General Pershing"—which is completely lighted with fluorescent units. New and improved vibrating switch inverters and motor alternators have been developed to supply the required alternating-current power from the d. c. power supply system on the cars.

The Rock Island has applied fluorescent lighting to two large accounting department offices in its Hamilton Park office building, in Chicago. During the past year a 4-ft. lamp was added to the available units and many new fixtures were placed on the market. The quality of light output was better and the maintenance and operation of auxiliaries was improved by the making of starting switches separate from the control reactor.

Individual Car Power Plants

A four-car train—the "General Pershing"—placed in service by the Chicago, Burlington & Quincy on April 30, 1939, has individual Diesel-electric power plants on

(*Continued on page 92*)

A Review of Railway Operations in 1939

By Dr. Julius H. Parmelee

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RAILWAYS of the United States experienced a gradual rise in traffic and earnings in 1939, considerably accelerated during the last four months of the year, which brought them out of the slough of despond into which they had all but fallen in 1938. They did not attain any degree of prosperity, but did find themselves on a road leading upward, which we may hope will prove the real road to recovery.

The moderate improvement in traffic that began late in 1938 continued into 1939. Freight traffic showed so sharp and unprecedented an increase from August to October that some observers doubted the ability of rail carriers to meet the demand. They did meet it, however, by active and concerted effort. The rail plant and facilities proved adequate to the sudden strain thrown upon it. Operating efficiency was generally at a high level during the year.

For the year as a whole, freight traffic increased nearly 15 per cent over 1938, while passenger traffic increased six per cent. Gross revenues were up 12½ per cent, and net railway operating income 58 per cent. While a number of companies failed to earn their fixed charges, the Class I group as a whole emerged out of the red and showed a net income of approximately $85,000,000.

No general changes occurred in freight rates and passenger fares. Wage schedules were affected, primarily in the lower brackets, by the operation of the Fair Labor Standards (Wage and Hour) Act of 1938, which in October, 1938, had set a "floor" or minimum of 25 cents per hour under railway wage rates. That minimum increased to 30 cents in October, 1939. Material prices remained at about the 1938 levels until mid-1939, then began a gradual upward trend to the close of the year.

In the legislative field, some progress took place, although no piece of general Federal legislation affecting the railways became law. The Voluntary Adjustment Act, or Chandler Act, designed to help several railways to rearrange their obligations to creditors, became effective for a limited period. Another helpful bill, which would have relieved carriers of part of the cost of bridge construction or improvement, was vetoed by the President. Both houses of Congress passed general bills designed to enlarge the field of transport legislation; these bills (S-2009), differing considerably in detail, were in the hands of a conference committee of the two houses at the end of the year.

Our review of railway operations in 1938 closed with a reference to war and the international situation, which may be cited in part as follows:

> Unfortunately (we said), the threat of war still hangs over the world, and may cast lengthening shadows over the events of 1939. The success or failure of the nations of Europe and Asia to avoid war will largely determine the course of events, both industrial and political, in those continents, and on the Western Hemisphere as well.

War rather than peace proved the year's portion. Six nations of Europe were actively engaged at the close of 1939, and the world faced the problems of *how long, how* many additional countries, and *what* effect on neutrals? As the largest and most powerful neutral nation, the United States in 1939 felt the impact of the war across the ocean, and seemed likely to experience even greater repercussions in 1940. In what direction and to what extent, only the final record of events in 1940 will reveal.

Traffic and Revenue Trends

Revenue carloadings in 1939 showed a considerable increase over those of 1938, the increase being 3,631,000 cars, or 11.9 per cent. This did not bring them up to the level of either 1936 or 1937, however, the total for 1939 being less than in 1936 by 2,009,000 cars, and less than in 1937 by 3,570,000 cars.

Carloadings, which began an upward trend in November, 1938, continued above 1938 with virtually no interruption throughout the whole of the year 1939. The coal shutdown that took place in April and May retarded the rate of increase, but the trend picked up rapidly thereafter. Thus for a period of 59 weeks, the last seven weeks in 1938 and the 52 weeks of 1939, steady growth took place over the corresponding levels of the next preceding year.

The peak loading of 1939 occurred during the week of October 21, with a total of 861,198 cars. This peak, which was 18.6 per cent higher than the peak of 726,142 cars attained in 1938, was higher also than the peak loadings of 1936 and 1937. Whereas weekly loadings during 1938 exceeded 700,000 cars in only four weeks, that figure was surpassed in 1939 in eleven weeks, while 800,000 was exceeded in eight of the same weeks.

Not only was the trend in carloadings generally upward in 1939, but the rate of increase rose progressively during the year. This is indicated by the following percentage increases in carloadings for each of the three four-month periods of the year. Corresponding increases in freight revenue for the same periods are also shown.

Percentage Increase, 1939 over 1938

	Car-loadings	Freight revenue
First 4 months	5.8	11.5
Second 4 months	11.9	11.7
Third 4 months	16.7	19.1
Year	11.9	14.4

Both carloadings and freight revenue showed greater increases in the second four than in the first four months, and the increases took a sharp upward trend in the third four-month period, from September 1 on. The lesser spread between the first and second four-month periods in freight revenue than in carloadings is due, of course, to the fact that the increased freight rates authorized by

the Interstate Commerce Commission in Ex Parte 123 became generally effective on March 28, 1938, and were not fully reflected in freight revenue until after that date.

Table I summarizes railway freight and passenger traffic in the years 1930, 1932, and the years 1935 to 1939, inclusive. The entries for 1932 measure the low point of the depression period.

Table I—Comparative Statistics

Revenue Carloadings
(Thousands)

1939	34,100
1938	30,469
1937	37,670
1936	36,109
1935	31,504
1932	28,180
1930	45,878

Revenue Ton-Miles
(Millions)

1939	332,500
1938	290,084
1937	360,620
1936	339,246
1935	282,037
1932	233,977
1930	383,450

Revenue Passenger-Miles
(Millions)

1939	22,900
1938	21,629
1937	24,655
1936	22,421
1935	18,476
1932	16,971
1930	26,815

The carloading trends have already been summarized. Revenue ton-miles in 1939 exceeded those of any year from 1931 to 1935. They were 14.6 per cent greater than those of 1938, but fell short of the totals of 1936 and 1937 by 2.0 per cent and 7.8 per cent, respectively.

Revenue passenger-miles were greater than in any year from 1931 to 1936. They exceeded the total for 1938 by 5.9 per cent, but fell below the total for 1937 by 7.1 per cent.

Chart A shows the monthly trend of carloadings for the years 1939 and 1938, also for the years 1937, 1932 and 1930. The line for 1937 was inserted, because it was the heaviest traffic year of the depression that began late in 1929.

The lines or curves on this chart are index numbers developed by the Federal Reserve Board, and are based upon averages of the years 1923 to 1925, taken as 100, adjusted for seasonal variations.

The curve for 1939 clearly shows how the freight traffic ran moderately above 1938 during the first eight months of the year, then took a sharp upward rise in September, October, and November, declining in December to a level more nearly that of the first months of the year. The average yearly index, which stood at 92 in 1930, and at 78 in 1937, declined to 62 in 1938, and made a partial comeback to 71 in 1939.

Adequacy of Railroad Plant

Following the outbreak of war on September 1, this country experienced a quickening pace in business activity. That situation gave rise to considerable speculation as to the ability of rail carriers adequately to handle a greatly increased volume of traffic, with reduced number of equipment units and some undermaintenance in rolling stock and fixed property. However, fears on this score proved to be groundless and the precipitous rise in carloadings was handled without a car shortage of any consequence.

The predictions of a railroad breakdown were based largely on the reduction in equipment units. As of October 1, 1939, railways of Class I had 42,784 locomotives in service, a reduction of 14,163 units, or 24.9 per cent, under the number in service on October 1, 1929. As to freight cars, the number on line totaled 1,836,570 on October 1, 1939, compared with 2,475,591 on October 1, 1929, a reduction of 639,021 cars, or 25.8 per cent.

However, the number of physical units of equipment is not, in and of itself, the only measure to be considered. Improved performance of the average unit is a highly significant factor. Between 1929 and 1939, the average tractive power of steam locomotives per unit increased 13.9 per cent, while the average capacity of freight cars per unit increased 7.7 per cent, the units of equipment placed in service during the interval having been of much greater capacity than that of the older units retired. Freight train speed in October, 1939, was nearly 24 per cent greater than it was ten years earlier, and this factor was mainly responsible for the decrease in the average "turn-around" time of a freight car.

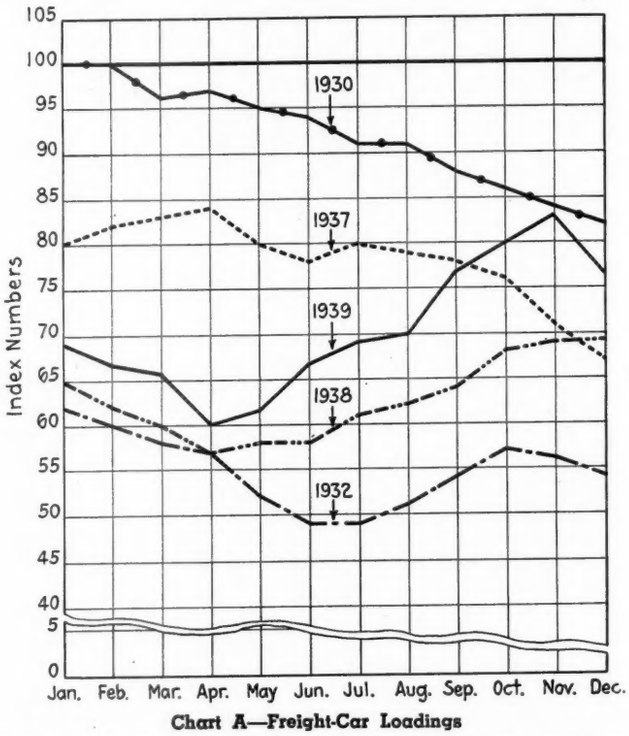


Chart A—Freight-Car Loadings

Index of Freight-Car Loadings by Months—1930, 1932, 1937, 1938 and 1939 (1923-1925=100—Monthly figures adjusted for seasonal variation)

(Source: Federal Reserve Bulletin)

As already indicated, the increase in carloadings between August and October, 1939, was the greatest, both actually and relatively, of any similar period of record. Realizing that this situation was in the making, railway executives met in early September to appraise and consider traffic requirements. This meeting, held at Washington on September 19, was reminiscent of that of April, 1923, when the carriers adopted the "Program of the Railroads to Provide Adequate Transportation Service." By unanimous action the following resolution was adopted in September:

> Resolved, That all roads take immediate steps to place their motive power and cars in shape to handle any probable increase in traffic.

As of August 1, 1939, there were 1,886 freight locomotives stored and in serviceable condition. During the

first part of August, 1939, there were 146,598 stored surplus railroad freight cars.

The number of freight locomotives in shop or awaiting shop on August 1 totaled 6,250, or 23.3 per cent of all freight locomotives owned. As of August 1, there were 228,541 railroad owned freight cars in unserviceable condition, or 14.0 per cent of the total.

In keeping with the carriers' determination to be prepared to handle the rising volume of traffic, railways reduced the number of bad-order freight locomotives from 6,250 on August 1 to 5,072 units on December 1. Unserviceable freight cars were reduced from 228,541 to 158,519. In addition to repair of existing equipment, large orders for new units have been placed.

Railway Taxes

Railway tax accruals in 1939 amounted to $365,000,000, approximately one million dollars per day. This compared with $340,780,000 in 1938, an increase of 7.1 per cent.

Since the payroll tax rates on railways as employers remained the same as in 1938, three per cent for unemployment compensation and 2¾ per cent for railroad retirement, the increase in payroll taxes was due entirely to increased employment and compensation. (The railroad retirement tax rate of 2¾ per cent increased to 3 per cent on January 1, 1940).

Payroll tax accruals in 1939 amounted to $109,000,000, compared with $99,157,000 in 1938, an increase of 9.9 per cent. Actual separation of payroll taxes for 1939 as between retirement taxes and unemployment compensation taxes is not available. However, based on ratios of the respective tax rates to the total rate, the amounts would be, respectively, $52,000,000 for railroad retirement, compared with $47,000,000 in 1938, and $57,000,000 for unemployment compensation, against $52,200,000 in 1938.

Railway taxes other than those levied on payrolls increased from $241,625,000 in 1938 to $256,000,000 in 1939, reflecting among other things increased accruals of gross revenue and income taxes occasioned by the rise in earnings.

Railroad Retirement

As of November 30, 1939, there were 137,635 persons on the rolls of the Railroad Retirement Board, receiving an aggregate monthly amount of $8,662,000 in benefits (annuities, pensions, or other benefits), or $103,946,000 per year. Total payroll tax accruals for railroad retirement in 1939—including taxes levied on employees as well as on employers—amounted to approximately $116,000,000. This total includes railway and other employers subject to the act.

The number of persons receiving benefits showed a net increase of 29,394 between June, 1938, and November, 1939, at an aggregate monthly amount of $1,954,000, or $23,447,000 per year. This increase occurred despite a reduction (by death) in the number of pensioners, or persons transferred from the voluntary pension rolls of the carriers in 1937. Their number declined from 43,914 to 37,872, a net reduction of 6,042 persons, at $4,100,000 per year. The average monthly employee annuity as of November 30, 1939, was $65.51, while the monthly average pension per pensioner was $58.44.

Actual retirement tax collections from January 1, 1937, to November 30, 1939, amounted to $293,965,000. However, since tax collections are made on a quarterly basis this figure does not reflect the full amount of accrued liability as of the latter date. The excess of accrued tax liability over actual collections to November 30, 1939, was approximately $16,000,000. Actual tax accruals for the whole period were, therefore, $310,000,000.

Benefit payments for annuities, pensions, etc., totaled $231,693,000 from January 1, 1937, to November 30, 1939. The Board had a reserve of $77,200,000 on November 30, invested in 3 per cent Treasury notes.

A simple and non-accounting statement of retirement accruals, receipts and expenditures to date would be as follows:

January 1, 1937 to November 30, 1939

Tax accruals		$310,000,000
Interest		3,613,000
		$313,613,000
Less		
Benefit payments	$231,693,000	
Administrative expenses	8,281,000	239,974,000
Balance		$73,639,000

The balance is represented in part by taxes accrued but not yet collected, reserves, and the unexpended balance of appropriations.

Tax accruals in 1938 and 1939 ran behind the amounts estimated by actuarial experts at the time the Railroad Retirement Act was drafted in 1937, while benefit payments have considerably exceeded the estimates made at that same time.

Railroad Unemployment Compensation

The national system of unemployment compensation for rail employees, set up by the Railroad Unemployment Insurance Act of 1938, became effective July 1, 1939. Certain amendments to the act were made in a bill signed by the President on June 21, 1939. These amendments were principally designed to reduce administrative complexities and expenses.

The first benefit checks were mailed to eligible workers during the week beginning July 17, 1939. From that date to December 15, a period of five months, benefit payments were certified amounting to $5,096,000, an average payment of $14.95 for each period of 15 days of unemployment certified.

It is estimated that unemployment benefits during the first year of the act, ending June 30, 1940, will aggregate between $12,000,000 and $15,000,000. During that same period of twelve months, tax accruals for unemployment compensation, assessed on employers at the rate of three per cent on their payrolls, will equal or exceed $60,000,000. The Railroad Retirement Board expects to recoup from state unemployment balances under the Social Security Act a sum variously estimated, but believed to be not less than $100,000,000. If these estimates are correct, the Board will, on July 1, 1940, have to its credit or in prospect a reserve of approximately $140,000,000, equivalent to more than two years of tax accruals. This sum is derived by adding $100,000,000 and $60,000,000, and deducting $15,000,000 for unemployment benefits and $5,000,000 for administrative expenses. The question has already arisen as to whether the railroad industry, because of its good record for stability of employment, is not entitled to a lower tax rate for this purpose than industry generally.

Legislation in 1939

The following more important bills, in which railways have a direct or collateral interest, were enacted by the first session of the 76th Congress, January 3 to August 5, 1939. The second or special session of September

21 to November 3 considered no general matters except revision of the neutrality act.

Chandler Bankruptcy Bill (Voluntary Adjustment Act). This act, approved July 28, and effective to July 31, 1940, authorizes railroads to agree with 75 per cent of their creditors on a voluntary plan of debt adjustment.

The act permits any railroad not in equity receivership or in process of reorganization under the Bankruptcy Act at the time of filing its petition, or within ten years prior thereto, to submit a plan of adjustment. An order must then be obtained from the Interstate Commerce Commission authorizing issuance or modification of securities proposed by such plan, with specific findings that the railroad involved is not in need of financial reorganization, that the corporation's inability to meet its debt is reasonably expected to be temporary, and that assent to the plan has been given by creditors holding more than two-thirds of the aggregate amount of claims affected.

The plan may next be filed in the United States District Court. Proceedings are conducted by a special court of three judges, who shall, if the plan is deemed satisfactory, enter a decree approving and confirming such plan of adjustment. The final plan must be accepted by creditors holding more than 75 per cent of the aggregate amount of claims affected.

The Baltimore and Ohio has already consummated a plan of reduction in current fixed charges, and other readjustments, under the terms of the act.

Tax Bill. (H. R. 6851—Public No. 155). Section 215 of this act permits a railroad to purchase its securities at less than par, without counting as part of its taxable income the difference between par value and purchase price. This relief from taxes is available only to corporations in unsound financial condition, which fact must be certified to the Commissioner of Internal Revenue by any Federal agency authorized to make loans on behalf of the United States to such corporation, or by any Federal agency authorized to exercise regulatory power over such corporation, or the Commissioner may satisfy himself of this fact.

Amendment to Federal Employers' Liability Act. S. 1708—Public No. 382, approved August 11, amended the Employers' Liability Act. The effect of the act is to abolish the defense of assumption of risk in cases arising under the Federal Employers' Liability Act. It also extends the provisions of the act to certain cases which have heretofore been generally construed as falling under state Workmen's Compensation Acts.

Investigation of Express and Freight Traffic. Senate Resolution 146, adopted July 6, authorized an investigation by the Senate Interstate Commerce Committee into (1) the nature and legality of the methods now employed by common carriers by railroad for the handling of their express traffic, their forwarder or consolidated car load freight traffic, and their freight traffic in less than carload lots, and (2) the possibility of improving methods of handling such traffic.

The subcommittee appointed to conduct this investigation consists of Senators Wheeler, Hill and Reed.

Railroad Unemployment Insurance Act. H. R. 5474—Public No. 141, was approved on June 20. This act contains a number of clarifying amendments to the Railroad Unemployment Insurance Act.

Truman Bridge Bill. The Truman Bridge Bill, so-called, was passed by both houses of Congress, but failed to receive Presidential approval. This bill provided that when railroads are required to rebuild or relocate bridges over navigable streams, the government would pay that portion of the expense attributable to navigation.

Legislation Introduced But Not Enacted

During the first session over 10,000 bills were introduced, of which some 475 were of interest to railroads. However, the session was more notable for legislation which failed to pass than for measures enacted into law.

1. *The Omnibus Transportation Bill* (S. 2009). This bill was introduced in Congress by Chairman Lea of the House Committee on Interstate and Foreign Commerce as H. R. 4862. The Senate Committee on Interstate Commerce introduced a bill of its own, S. 2009. Hearings were held in the House and in the Senate on the respective bills.

The Senate passed its bill, with certain amendments, on May 25th. The House Committee approved a bill bearing the number S. 2009, which was quite different from the bill which passed the Senate bearing the same number. This bill was reported to the House on July 18th, and with certain amendments passed on July 26th.

The Senate and House bills are similar in purpose but differ in many important provisions. Conferees were appointed by both bodies, and are expected to meet early in January.

2. *Through Routes.* Two bills were introduced, prohibiting the elimination of any through route or joint rate without the consent of all carriers parties thereto, or by the Interstate Commerce Commission.

3. *Amendments to Railroad Retirement Act.* Several bills were introduced in Senate and House, proposing amendments to the Railroad Retirement Act. All failed of enactment.

4. *Interterritorial Freight Rates.* A number of bills were introduced dealing with interterritorial freight rates and alleged discriminations. Provisions in the Omnibus Bill direct the Interstate Commerce Commission to investigate that situation.

5. *Straightjacket Bill.* A so-called "straightjacket" bill, which would give the Interstate Commerce Commission control over "outside" investments of railroads, was passed by the Senate on August 1. No action was taken by the House.

6. *Reorganization Court Bill.* Senator Wheeler introduced a bill (S. 1869) providing for a central reorganization court empowered to handle all matters arising in Section 77 bankruptcy proceedings. The Senate passed it on May 27. When it reached the House, the bill was referred to the House Committee on the Judiciary. Extensive hearings were held by a subcommittee of which Congressman Chandler of Tennessee is chairman.

Receiverships and Trusteeships

The number of railroad companies in receivership or trusteeship at the end of 1939 was the same as at the beginning, 109 companies of all classes, including 39 in the Class I group. Changes during the year occurred as follows: One Class I company and one lessor company were placed in trusteeship, while one Class III company was placed in receivership; one Class I company in trusteeship at the beginning of the year was reclassified during the year as a Class II company; two Class II companies and one Class III company were taken out of receivership or trusteeship during the year.

At the year's end, 77,414 miles of railroad were in

receivership or trusteeship, an increase of 476 miles during the year. This mileage represented 31 per cent of the total railway mileage of the country. In the Class I group, 39 companies operating 75,114 miles of railroad were in receivership or trusteeship at the end of 1939, an increase of 666 miles. Those companies operated 32.1 per cent of total Class I mileage.

The following table indicates the relative importance of Class I roads now undergoing reorganization in the courts.

39 Class I Railways Operated by Receivers or Trustees

	Amount Year 1938	Per cent of All Class I Railways
Investment in road and equipment	$5,594,248,084	27.7
Capital stock	2,148,399,158	26.4
Unmatured and matured funded debt	3,430,644,480	32.4
Stock plus unmatured and matured funded debt	5,579,043,638	29.8
Total operating revenues	852,242,546	23.9
Number of employees	243,166	25.9

Progress was made during the year in the reorganization of receivership and trusteeship roads. Plans of reorganization for three Class I companies were approved in the courts, but had not been confirmed by the close of the year; two original plans and five modified plans for Class I companies were certified by the Interstate Commerce Commission to the respective courts; six proposed plans were reported by Commission examiners. The Commission declined to approve one plan for reorganization.

Of 21 plans for reorganization either approved by the Commission or proposed by examiners to date, including 13 Class I companies, the proposed changes in capital structure would result in debt reduction of about 60 per cent, and in a reduction of about 75 per cent in annual fixed charges.

Railway Financing

Indebtedness of the carriers to the government decreased by $21,307,252 during the first ten months of 1939.

As of October 31, 1939, the status of railway financing through government agencies was as indicated below:

Total loans (R. F. C. and P. W. A.)	$851,411,961
Repaid by railways	270,706,010
Balance, October 31	$580,705,951
Of which there had been sold to the public at a net profit of $5,185,115	125,272,000
Still held by government	$455,433,951

A total of $27,869,052 was repaid by the carriers during the first ten months of 1939. This amount is included in the total repayment of $270,706,010 shown above. New borrowings during the period were less than the aggregate of repayments, totaling $25,336,800. The net profit to the government from securities sold to the public increased from $4,702,563 on December 31, 1938, to $5,185,115 on October 31, 1939.

The Railroad Credit Corporation continued its liquidating payments during 1939 to participants in its pool. As of November 30, 1939, $57,706,441, or 78.5 per cent, of the original loan fund had been liquidated by pro rata distribution to participants in the fund.

Rates and Fares

The following were the principal developments, during 1939, in the field of freight rates, express rates, and passenger fares.

Express Rates. The Interstate Commerce Commission on February 6, 1939, rendered its report in Ex Parte No. 126, Express Rates, 1938-1939, in which it found that the proposed increased rates and charges for shipments weighing 100 pounds or more were justified, with minor exceptions. Proposed changes in graduated charges on packages of less than 100 pounds were also found to be justified. It was estimated that the increases would amount to approximately $10,000,000 annually.

Passenger Rates in East. The Commission on June 5 granted the application of Eastern railroads, permitting them to reduce round-trip fares on five days' notice.

In an order made public on December 12, the Commission extended until March 24, 1940, the 2.5 cent per mile passenger coach fare in effect in Eastern District, which was to have terminated on January 24, 1940. Hearings on an application of the carriers to extend the 2.5 cent rate for nine months were set for January 4, 1940.

Southern Governors Rate Case. Contention of several Southern governors that that section of the country has been retarded economically by certain freight rate barriers, was partially upheld in a five-to-four decision made public on November 30 by the Commission. Two members of the Commission did not participate in the decision. Its order, effective March 1, 1940, required adjustments in rates on a limited number of manufactured or processed articles moving between north and south. The majority opinion took the position that the south-to-north rates were higher on certain commodities involved in the proceeding than corresponding rates in the north, thus placing southern producers at an "undue disadvantage" compared with northern competitors. Vigorous dissents were filed, including an unusually outspoken one by Chairman Eastman.

Preferential Rates to Large-Quantity Shippers. Reversing a long-standing policy, the Interstate Commerce Commission on December 14 ruled that it is not unlawful for railroads to give shippers of multiple quantities a preference in rates over shippers of single carloads. The decision involved movement of blackstrap molasses in tank cars from New Orleans and Harvey, La., to Peoria and Pekin, Illinois.

Miscellaneous. The Commission announced in September that it had entered upon a general investigation into the lawfulness of "all-freight commodity" railroad rates applying from Chicago and from Mississippi and Ohio river crossings to points in southern territory. In December, approximately 45 railroad and steamship companies asked for an investigation of motor carrier rates between North Atlantic ports and Southern territory. The Commission denied the petition. The Commission instituted in August a general investigation of (1) class rates, rail and water, applicable in the United States generally, except in Mountain-Pacific territory on transcontinental traffic, and (2) freight classifications by rail and water, with a view of prescribing such rates and classifications as may be justified.

The Commission denied in January the petition of the National Automobile Transporters' Association seeking suspension of reduced rail rates for transportation of automobiles from central producing points. The Commission in February entered upon an investigation into the transportation of automobiles. An investigation into freight classifications of common carriers by motor vehicle was instituted in August.

The Competitive Situation

Competition between the railways and other forms of transport continued to grow in severity during 1939.

This was particularly true of highway competition. Indexes developed by the Bureau of Railway Economics show that the total volume of commodities moving from producer to consumer in 1939 averaged 82 per cent of the volume of 1928. On the other hand, the amount of traffic handled by the railways in 1939 averaged only 68 per cent of the 1928 level. This indicates a loss or diversion of freight traffic from the rails to other agencies of transport of 14 points, or 17 per cent, since 1928. In 1938 the indicated diversion of traffic from the rails was 15 per cent.

The American Trucking Associations' index of revenue freight moving by motor truck stood at 121.7 for the first ten months of 1939 (1936 being taken as 100), compared with 97.2 in 1938 and 108.5 in 1937. Corresponding indexes for rail shipments (carloadings) averaged 91.9 in 1939, 81.1 in 1938, and 106.8 in 1937. According to these figures, truck loadings showed an increase in 1939 of 21.7 per cent over 1936, while rail shipments showed a decrease of 8.1 per cent.

Nearly 650 intercity common or contract motor carriers of freight reported to the Interstate Commerce Commission comparable statistics of operation for the first six months of 1939 and 1938. These data showed that truck and tractor miles operated increased 28.7 per cent, and tons of freight transported increased 22.4 per cent, in the first six months of 1939. Operating revenues increased 29.9 per cent, while net operating revenue increased 342 per cent. These were substantially greater relative increases than the railroads experienced.

Reports of intercity motor carriers of passengers to the Interstate Commerce Commission for the first six months of 1939 showed an increase of 7.5 per cent in bus miles operated and an increase of 11.2 per cent in number of revenue passengers carried, compared with the corresponding period of 1938. Operating revenues increased 11.6 per cent, while net operating revenue increased 46.4 per cent. These increases were also substantially greater than those reported by railroads in the passenger field.

Carriers by water reporting to the Interstate Commerce Commission showed an increase in number of tons of revenue freight carried of 4.1 per cent during the first nine months of 1939, compared with the corresponding period of 1938. Operating revenues increased 10.1 per cent.

The Federal Barge Lines, owned and operated by the Federal Government, reported a decrease of 23.4 per cent in tonnage and a decrease of 17.4 per cent in revenues during the first nine months of 1939. Such a decrease was expected, because the exceptionally heavy movement of grain in 1938 over the Barge Lines was a temporary phenomenon. During the year 1939, the Inland Waterways Corporation, which operates the Federal Barge Lines, was transferred from the jurisdiction of the War Department to that of the Commerce Department. General T. Q. Ashburn, who had served as president of the Corporation since its creation in 1924, was replaced by Chester C. Thompson.

Oil pipe line companies reporting to the Interstate Commerce Commission, for the first six months of 1939, showed a decrease of 0.3 per cent in number of barrels of oil handled, compared with the corresponding period of 1938.

In a decision handed down on December 4, 1939, a statutory Federal three-judge court held that the Interstate Commerce Commission has authority to regulate the hours and qualifications of all employees of common and contract motor carriers. The Commission had contended that its power was limited to hours of work and qualifications of drivers or others whose activities affect the safety of operation of motor vehicles. It is understood that the Commission will appeal this decision to the Supreme Court.

The Commission on August 9, 1939, instituted an investigation into freight classifications of common carrier motor carriers. In a report and order issued on November 25, 1939, the Commission ruled that on and after April 1, 1940, contacts of contract motor carriers filed with the Commission will be open to public inspection.

Material and Supply Costs

The index of average unit prices of railway materials and supplies developed by the Bureau of Railway Economics stood at 133.8 in December, 1939 (the average for May, 1933, being 100), compared with 129.9 in December, 1938. During the first part of 1939 material prices, on the average, stood at about the December, 1938, level, the upward swing occurring during the latter part of the year. Price indexes for various dates since May, 1933, are as follows:

	Materials and supplies (Other than fuel)	Fuel (Coal and oil)	All Materials
May, 1933	100.0	100.0	100.0
December, 1935	118.5	127.7	121.7
December, 1937	136.7	141.5	138.3
December, 1938	127.8	133.8	129.9
June, 1939	126.7	135.2	129.6
December, 1939	132.7	136.1*	133.8

* As of October, 1939.

The average unit price of material and supplies (other than fuel), as of December, 1939, averaged 32.7 per cent higher than in May, 1933, and 3.8 per cent higher than in December, 1938.

The average price of coal at point of purchase or production increased from $1.51 per ton in May, 1933, to $1.96 per ton in December, 1938, and to $2.01 per ton in October, 1939. Since October 1, 1938, the Bituminous Coal Commission (now the Bituminous Coal Division of the Interior Department), acting under authority of the Bituminous Coal Act of 1937, has held a long series of hearings which will eventually lead to the establishment of minimum coal prices. These hearings were still in progress at the close of 1939.

The price of fuel oil averaged 56 cents per barrel in May, 1933, 84 cents per barrel in December, 1938, and 83 cents per barrel in October, 1939.

The weighted average price of coal and oil combined showed an increase of 33.8 per cent from May, 1933, to December, 1938, and an increase of 1.7 per cent from December, 1938, to October, 1939.

Other Developments

The Pennsylvania Full Crew Law, enacted in 1937 and requiring, generally speaking, an additional brakeman on five-car passenger and fifty-car freight trains, was declared unconstitutional on March 15, 1939, by the Dauphin County Court, on the ground that it violated both the state and federal constitutions and would not promote safety. The Pennsylvania Supreme Court, in a unanimous opinion, upheld the decision of the lower court.

The Southern Pacific Company in April filed in the District Court of the United States in and for the District of Arizona a complaint for declaratory relief from enforcement of the Arizona Train Limit Law. This law has been in effect since 1912. A previous attempt to

have the law set aside was frustrated in the U. S. Supreme Court several years ago by a legal technicality, after the railroads had obtained a favorable decision in the lower court.

There was no change during the year in the status of the Louisiana Train Limit Law of 1936 or the Oklahoma Train Limit Law of 1937, the enforcement of each of which has been temporarily enjoined.

The U. S. Supreme Court in a decision handed down on December 4, 1939, upheld the right of the Interstate Commerce Commission, in passing upon an application of one railroad to lease another, to impose as a condition precedent that provision be made for displaced employees, those losing seniority rights and those required to move from one place to another. The question arose in connection with the application of the Chicago, Rock Island and Pacific Railway Company to lease the properties of the Chicago, Rock Island and Gulf Railway Company.

Principal Operating Factors

The following summary compares the statistical results of railway operation in 1939 with the corresponding results for 1938 and 1930. A more detailed analysis of the several factors will follow. All of the statistics in this and succeeding statements relate to railways of Class I, and are subject to revision when final reports of the carriers become available for the year 1939.

1. Freight traffic (ton-miles) increased 14.6 per cent over 1938, but fell 13.3 per cent below 1930.

2. Passenger traffic (passenger-miles) increased 5.9 per cent over 1938, but fell 14.6 per cent below 1930.

3. Operating revenues increased 12.5 per cent over 1938, but were 24.1 per cent under 1930.

4. Total operating costs (operating expenses, taxes, and operating rentals) amounted to $3,420,000,000 in 1939, compared with $3,193,000,000 in 1938, an increase of 7.1 per cent.

5. Net railway operating amounted to approximately $590,000,000 in 1939, an increase of 58.2 per cent over 1938, but less than in 1930 by 32.0 per cent.

6. Net income after fixed charges amounted to approximately $85,000,000 in 1939. This compares with a net deficit after fixed charges in 1938 of $123,000,000 and with a net income of $524,000,000 in 1930.

Chart B outlines the six factors appearing in the foregoing summary on an index basis, the comparative figures for 1930 being taken in each case as 100 per cent. The chart includes a comparison of the years 1930, 1932, and 1937 to 1939.

Comparing 1939 with 1930, both total operating revenues and total operating costs were slightly more than three-fourths as great, while net railway operating income was only slightly more than two-thirds as great. Net income after fixed charges was less than one-sixth of that of 1930. Both revenue ton-miles and revenue passenger-miles were slightly more than five-sixths as great as in 1930.

Comparison of the ratios of 1939 with those of 1938 indicates a spread of increase of 8.4 percentage points in operating revenues in 1939; 5.1 percentage points in total operating costs, and 25.0 points in net railway operating income. This demonstrates that in years of depressed traffic and earnings such as 1938 an irreducible minimum is approached with respect to operating expenses, thereby reducing the amount of revenue that can be translated into net operating income. In years of more favorable traffic and revenue, the proportion of revenue carried through to net operating income is relatively greater. This proportion was 14.7 per cent in 1939, compared with 10.5 per cent in 1938. That is, slightly more than ten cents of every dollar of gross earnings went through to net in 1938, whereas the corresponding figure for 1939 was nearly 15 cents per dollar.

Since the number of revenue dollars were greater in 1939 than in 1938, this increase in cents of net per dollar of revenue reflected the operation of the law of increasing return. Thus, of the increase of $445,000,000 in total operating revenue from 1938 to 1939, $217,000,000 went through to net railway operating income, or 49 cents out of each dollar of such increase in gross.

Loadings by Commodity Groups

Table II distributes the carloadings of 1939 among the eight principal commodity groups, according to the classification of the Car Service Division, Association of American Railroads. The percentage increase in each group, 1939 over 1938, is shown in the second column of the table.

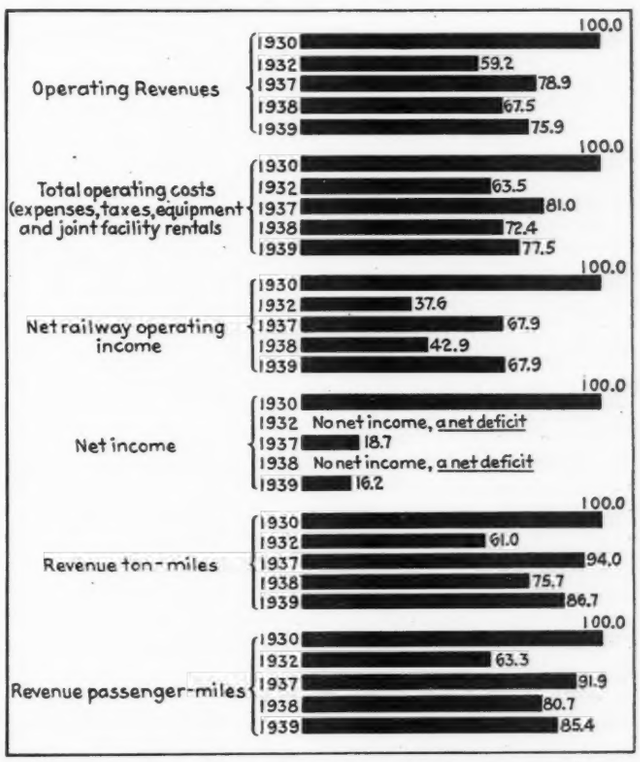


Chart B—Comparative Results for Years 1930, 1932, 1937, 1938 and 1939 (1930=100)

Table II—Distribution of Carloadings, 1939

	1939 Number (000)	Per cent Increase 1939 over 1938	Per cent Distribution 1939	Per cent Distribution 1938
Grain and products	1,951	Dec. 0.8	5.7	6.4
Live stock	699	Dec. 0.6	2.0	2.3
Coal	6,213	12.1	18.2	18.2
Coke	402	46.2	1.2	0.9
Forest products	1,589	12.1	4.7	4.7
Ore	1,654	95.5	4.9	2.8
Mdse. L. C. L.	7,843	2.1	23.0	25.2
Miscellaneous	13,749	14.3	40.3	39.5
Total	34,100	11.9	100.0	100.0

Six of the eight commodity groups increased over 1938 while two decreased. The largest relative increase was that of ore loadings, which nearly doubled, while the least was that of Merchandise L. C. L. which in-

creased slightly more than 2 per cent. Ore loadings are less than 5 per cent of total loadings, while merchandise loadings are 23 per cent. Loadings of live stock fell to a new low for any year of record.

Financial Results in 1939

Condensed results of operations of Class I carriers in 1939, shown in the following four tables, Nos. III to VI, are summarized from available monthly reports; the comparative returns for earlier years are based on annual reports.

Table III is a condensed income account for the years 1939, 1938, and 1930. The year 1930 is included in this and succeeding tables, to supply a more nearly normal basis of comparison than that offered by intervening years since 1930.

Table III—Income Account

	1939 (millions)	1938 (millions)	1930 (millions)
Total operating revenues	$4,010	$3,565	$5,281
Total operating expenses	2,925	2,722	3,931
Taxes	365	341	349
Net railway operating income	590	373	869
Net income (after fixed charges)	85	Def. 123	524

Operating revenues showed an increase of 12.5 per cent in 1939. Corresponding increases in total operating expenses and taxes were 7.4 per cent and 7.1 per cent, respectively. Total operating revenues, which showed a decline of $601,000,000 between 1937 and 1938, increased by $445,000,000 in 1939, so that three-fourths of the amount lost in 1938 was regained in 1939.

The operating ratio, which stood at 74.4 per cent in 1930, and increased to 74.9 per cent in 1937, showed a further increase to 76.35 per cent in 1938. It then declined to 72.9 per cent in 1939.

Net railway operating income in 1939 amounted to $590,000,000, an increase of 58.2 per cent over 1938, but about the same as in 1937. It was, however, less by more than 11 per cent than that earned in 1936.

Net income after fixed charges for the Class I carrier group as a whole, was close to $85,000,000 in 1939. This compares with a *net deficit* after fixed charges amounting to $123,000,000 in 1938. It compares further with a net income of $98,000,000 in 1937, and a net income of $524,000,000 in 1930.

A number of companies did not, however, earn their fixed charges, while a few failed to earn their operating expenses and taxes. Preliminary indications are that 13 companies failed to earn their operating expenses and taxes, and suffered a net *operating* deficit; 57 companies failed to earn their fixed charges by greater or lesser margins; the remaining 73 companies earned their fixed charges by varying margins.

Comparing 1939 against 1937, total revenues declined 3.8 per cent, freight revenue 3.5 per cent, and passenger revenue 4.7 per cent. The carloadings were down in 1939 by 9.5 per cent, ton-miles declined 7.8 per cent, and passenger-miles 7.1 per cent. The net railway operating income, and the net income after fixed charges, were both somewhat less than they were in 1937.

It is clear from these figures that the improvement which took place in 1939 was not sufficient to bring the railroads back to the financial position they occupied in 1937, and that position in turn was far below the level of 1930.

Operating Revenues

Operating revenues in all classes of service showed increases in 1939 over 1938, at the same time that all of them ran considerably below those of 1930. Table IV compares the principal items of operating revenue in those three years.

Table IV—Operating Revenues

	1939 (millions)	1938 (millions)	1930 (millions)
Freight revenue	$3,260	$2,858	$4,083
Passenger revenue	422	406	730
Mail revenue	99	96	111
Express revenue	54	48	115
All other	175	157	242
Total	$4,010	$3,565	$5,281

Freight revenue, representing four-fifths of total operating revenues, increased 14.1 per cent over 1938, but was 20.2 per cent less than in 1930. Passenger revenue showed an increase in 1939 of 4.0 per cent over 1938, but was 42.2 per cent less than in 1930.

Express revenue, which represents contract payments

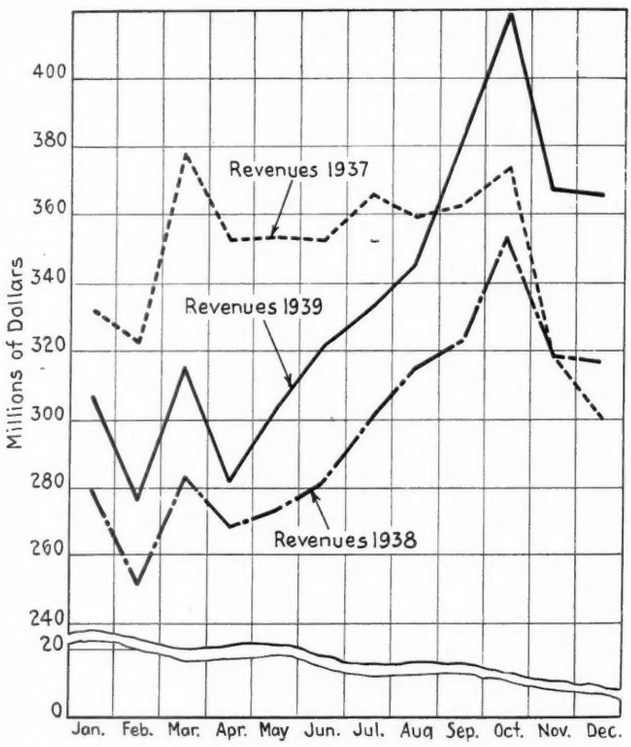


Chart C—Monthly Trend in Railway Revenues 1937, 1938 and 1939

to Class I carriers from the Railway Express Agency, Inc., increased 11.4 per cent over 1938. Gross charges for express transportation showed an increase of 5.7 per cent.

Operating Expenses

Table V compares the principal items of operating expenses in 1939 with those of 1938 and 1930.

Table V—Operating Expenses

	1939 (millions)	1938 (millions)	1930 (millions)
Maintenance of way	$473	$420	$706
Maintenance of equipment	764	677	1,019
Traffic	106	103	128
Transportation	1,421	1,361	1,848
General and other	161	161	230
Total	$2,925	$2,722	$3,931

Expenditures for maintenance of way and maintenance of equipment combined were greater in 1939 than in 1938 by about the same relative degree of increase as

that of operating revenues. The ratio of total maintenance expense to total operating revenues, therefore, remained the same as in 1938, about 31 per cent.

Maintenance expenditures as a whole increased 12.8 per cent in 1939, compared with an increase of 3.8 per cent in all other operating expenses combined. It is easy to see where the bulk of the increased expenditures in 1939 went—into maintenance work, and particularly into maintenance of equipment. Of the increase of $202,801,000 in total operating expenses, $140,346,000 was devoted to maintenance.

Net Railway Operating Income and Rate of Return

The rate of return in 1939 averaged 2.26 per cent. This is computed on book investment in railway property used in transportation service, including cash and material and supplies. Table VI shows the net railway operating income and rate of return on property investment for each of the ten years 1930 to 1939, inclusive.

Table VI—Net Railway Operating Income and Rate of Return

Year	Net Ry. Op. Inc. (000)	Rate of Return Per Cent	Year	Net Ry. Op. Inc. (000)	Rate of Return Per Cent
1939	$590,000	2.26	1934	$462,652	1.78
1938	372,846	1.43	1933	474,296	1.82
1937	590,204	2.26	1932	326,298	1.24
1936	667,347	2.57	1931	525,628	1.99
1935	499,817	1.93	1930	868,879	3.28

The rate of return on investment in 1939, 2.26 per cent, compares with 1.43 per cent in 1938. With the exception of 1936 and 1937, it was the highest return of any year since 1930. The corresponding rates of return for the three districts were as follows: Eastern District, 2.72 in 1939, compared with 1.60 per cent in 1938; Southern Region, 2.56 in 1939, compared with 1.91 in 1938; Western District, 1.67 per cent in 1939, compared with 1.10 per cent in 1938.

Computed on the basis of value (as found by the Interstate Commerce Commission, as of January 1, 1938), the rate of return for Class I carriers as a group in 1939 was 2.97 per cent.

Revenue Per Traffic Unit

Average revenue per ton-mile in 1939 amounted to 0.982 cent. This was a slight decline under the average of 0.984 cent reported for the year 1938. Since the increase in freight rates authorized by the Commission, Ex Parte 123, became effective on March 28, 1938, and was not fully reflected in the returns of the year 1938 as a whole, the slight decline in 1939 was due to other factors.

While no single factor can be said to account for this decline, it was probably due to changes in the composition of commodities transported, and continuing erosion in unit revenue by reason of efforts to meet competition from other agencies of transportation.

Revenue per passenger mile averaged 1.840 cents in 1939, compared with 1.874 cents in 1938, a reduction of 0.034 cent. The average was lower in 1939 than in any previous year of record, save only 1936 and 1937.

Certain changes in basic rates per passenger-mile contributed to this decrease, despite the increase in Eastern passenger coach fares that became effective July 25, 1938, and were only reflected in the last five months of that year; some reduction in unit passenger revenue occurred in 1939 by reason of the "scaled zone fares" inaugurated with certain exceptions by Eastern carriers on July 1, 1939; a reduction in passenger coach fares by Southeastern carriers became effective January 15, 1939; the large amount of travel to the two fairs (New York and San Francisco) on special-rate schedules.

Table VII shows average revenue per ton-mile and average revenue per passenger-mile for the years 1921, 1925, and 1930 to 1939.

Table VII—Revenues per Ton-Mile and Passenger-Mile

Year	Revenue per Ton-Mile (cents)	Revenue per Passenger-Mile (cents)
1939 (9 months)	0.982	1.840
1938	0.984	1.874
1937	0.935	1.794
1936	0.974	1.838
1935	0.988	1.935
1934	0.978	1.918
1933	0.999	2.013
1932	1.046	2.219
1931	1.051	2.513
1930	1.063	2.717
1925	1.097	2.938
1921	1.275	3.086

From 1921 to 1939 revenue per ton-mile declined 23.0 per cent and revenue per passenger-mile declined 40.4 per cent. The corresponding reductions from 1930 to 1939 were 7.6 per cent per ton-mile and 32.3 per cent per passenger-mile.

Capital Expenditures and Purchases

Table VIII shows the expenditures made by Class I railways for capital improvements and for the purchase of materials and supplies for the years 1930 to 1939. The entries for 1939 are, for the time being, rough estimates.

Table VIII—Capital Expenditures and Purchases

Year	Capital Expenditures	Purchases of Material and Supplies
1939 (est.)	$375,000,000	$750,000,000
1938	226,937,000	583,282,000
1937	509,793,000	966,383,000
1936	298,991,000	803,421,000
1935	188,302,000	593,025,000
1934	212,712,000	600,224,000
1933	103,947,000	465,850,000
1932	167,194,000	445,000,000
1931	361,912,000	695,000,000
1930	872,608,000	1,038,500,000
Total—ten years	$3,317,396,000	$6,940,685,000

Both capital expenditures and purchases of material and supplies increased in 1939 over 1938, again demonstrating that with improvement in earnings, the railways are quick to respond by making expenditures that go into the channels of trade, to the benefit of industry in general.

Expenditures of this nature are still far below previous levels. Capital expenditures for the eight years 1923 to 1930 averaged $842,715,000 per year, while for the nine years 1931 to 1939 they averaged only $271,643,000. Purchases of materials and supplies, which averaged $1,383,517,000 per year for the eight-year period 1923 to 1930, averaged only $655,798,000 during the nine years 1931 to 1939.

New (steam, electric, and Diesel) locomotives installed during the first eleven months of 1939 totaled 310, compared with 265 for the corresponding period of 1938. The number of locomotives on order December 1, 1939 was 115, compared with 56 as of December 1, 1938.

A total of 20,085 new freight cars were installed during the first eleven months of 1939, while 36,198 were on order as of December 1. During the first eleven months of 1938, 14,947 new freight cars were installed, while only 4,335 were on order December 1 of that year.

Table IX shows statistics as to locomotives and freight

car installations and number of units on order, in 1930 and for each year from 1935 to 1939.

Table IX—New Equipment Installations (Railroad owned or controlled units)

	Installed During Year	On Order December 31
Steam locomotives:		
1939 (11 months and Dec. 1)	94	44
1938	164	30
1937	373	131
1936	87	297
1935	40	5
1930	782	120
Electric and Diesel Locomotives:		
1939 (11 months and Dec. 1)	216	71
1938	118	41
1937	77	30
1936	34	7
1935	102	3
Freight cars:		
1939 (11 months and Dec. 1)	20,085	36,198
1938	18,517	5,080
1937	75,058	7,947
1936	43,941	25,592
1935	8,903	2,805
1930	76,909	9,821

While unit ownership of both freight cars and locomotives showed further declines in 1939, the average capacity of freight cars, average tractive effort of locomotives, and improvement in operating efficiency continued to increase, thus enabling the carriers to handle offered traffic efficiently with current equipment ownership.

Freight car ownership as of October 31, 1939 stood at 1,651,160 cars, compared with 1,698,646 as of October 31, 1938. Locomotive ownership was reported on October 31, 1939, as 42,179, and October 31, 1938 as 43,402.

Stored serviceable locomotives averaged 3,107 during 1939 (10 months). The maximum serviceable freight car surplus was 265,414 and the minimum was 64,299, exclusive of privately owned or special cars.

Freight Train and Car Movement

Again in 1939 the speed of freight trains rose to a new high level, the average being 16.7 miles per hour. In 1938 this average was 16.6 miles and in 1937, 16.1 miles, each a previous record. Since 1922, average freight train speed has increased 5.6 miles per hour, or 50.5 per cent. Table X shows average freight train speed for the years 1922, 1930, and 1935 to 1939.

Table X—Average Speed of Freight Trains

Year	Miles per Hour
1939 (10 months)	16.7
1938	16.6
1937	16.1
1936	15.8
1935	16.0
1930	13.8
1922	11.1

Maintenance of an average speed of 16.7 miles per hour for 24 continuous hours is the daily equivalent of 401 miles, an increase of 135 miles over 1922 performance.

During the first ten months of 1939, average movement per "active" freight car per day (excluding surplus and unserviceable units from the calculation) was 41.2 miles, compared with 38.8 miles for the same period of 1938.

Average movement per "active" freight locomotive (excluding stored and unserviceable units from the calculation) during the first ten months of 1939 was 104.0 miles. For the same period of 1938, the average was 98.9 miles.

Corresponding averages for "active" passenger locomotives were 184.5 miles per day in 1939, compared with 178.8 miles in 1938.

Other Performance Averages

Several new high records were attained during 1939 with respect to operating efficiency.

Economy in use of fuel in freight service again surpassed all previous records. Freight locomotive fuel consumption per 1,000 gross ton-miles averaged 112 pounds during the first 10 months of 1939, compared with 113 pounds for the same period of 1938.

Average load per train during the first 10 months of 1939 was the greatest in railroad history, reaching 807 tons. The corresponding average for 1938 was 756 tons. Ton-miles per freight car-mile (tons per car) increased in 1939 over 1938, the average for 1939 (10 months) being 26.7 tons compared with 26.0 tons in 1938 (10 months).

Net ton-miles per serviceable freight car day averaged 601 ton-miles during the first 10 months of 1939, compared with 513 ton-miles for the same period of 1938.

Gross ton-miles per freight train-hour for the eighth consecutive year exceeded all previous records. The averages for 1930 and for each of the years 1935 to 1939 are shown in Table XI.

Table XI—Gross Ton-Miles per Freight Train-Hour

1939 (10 months)	32,704
1938	31,138
1937	30,349
1936	29,200
1935	28,674
1930	25,837

Net ton-miles per freight train-hour during the first 10 months of 1939 exceeded the previous record established in 1937, the average being 13,368 ton-miles. The average for the same period of 1938 was 12,434 ton-miles and for 1937 was 12,695 ton-miles.

In the passenger service, the speed of locomotive-propelled trains during the first 10 months of 1939 averaged 36.9 miles per hour, compared with 36.2 miles in 1938; the average speed of rail-motor-car trains was 27.8 miles per hour, compared with 27.3 miles in 1938. The over-all average speed of all passenger trains was 35.3 miles per hour in 1939, compared with 34.7 miles in 1938.

Motive power fuel consumption per passenger train car-mile for the first 10 months of 1939 averaged the same as in the same period of 1938, 14.7 pounds.

Railway Employees

An average of 989,000 persons were employed by railways of Class I during 1939. This was an increase of 5.3 per cent over the year 1938, in which year railway employment reached the lowest level since the turn of the century. The number of employees aggregated less than one million in each of the first six months of 1939, and more than one million in each of the last six months.

The total payroll in 1939 amounted to $1,858,000,000, compared with $1,746,194,000 in 1938, an increase of 6.4 per cent.

Annual earnings of employees increased slightly from $1,859 in 1938, to $1,878 in 1939. Compensation per hour paid for averaged 74.7 cents in 1939, slightly less than the average of 74.9 cents for 1938.

Table XII shows for railways of Class I the average number of employees, and the aggregate and average

compensation for 1930 and for each year from 1935 to 1939.

Table XII—Employees and Their Compensation

Year	Average Number of employees	Total compensation	Average compensation per employee
1939	989,000	$1,858,000,000	$1,878
1938	939,505	1,746,193,567	1,859
1937	1,114,663	1,985,446,718	1,781
1936	1,065,624	1,848,635,804	1,735
1935	994,371	1,643,878,510	1,653
1930	1,487,839	2,550,788,519	1,714

Maintenance employees increased approximately 9 per cent over 1938, while all other employees increased 1.5 per cent.

The Fair Labor Standards Act of 1938, sometimes known as the Wage and Hour Act, became operative on October 24, 1938, when a minimum wage of 25 cents per hour was made mandatory for all employers subject to the act. Railways are subject to its minimum wage, but not the maximum hour, provisions. This minimum was raised to 30 cents per hour on October 24, 1939.

The third in the series of wage rate minima set by the act fixes the minimum rate at 40 cents per hour after October 24, 1945. However, the act provides for an intermediate step. The Wage and Hour Administrator is directed to appoint an industry committee for the several industries, to investigate, determine and recommend "the highest minimum wage rates for the industry which it determines, having due regard to economic and competitive conditions, will not substantially curtail employment in the industry."

Such a committee for the railroad industry was appointed by the Administrator on November 2, 1939, consisting of 12 members, four each representing employers, employees, and the public. Frank P. Graham, President of the University of North Carolina, is Chairman. The other three public members consist of two college professors and one lawyer. Hearings by the committee are expected to begin about the middle of February, 1940. The Administrator, after hearings, may or may not approve the recommendations of the industry committee. If he does approve, an appropriate order fixing the minimum will be issued by him. If he does not approve, he may refer the matter back to the original committee, or appoint a new one.

Safety of Railroad Operations in 1939

On the whole, the year 1938 was the safest in railroad history. This high standard of operating safety was continued into 1939, and statistics for the first nine months of the year, available at the time this is written, show further reductions in accident and casualty frequency rates.

The number of train accidents per million locomotive-miles, which was the lowest on record in 1938, declined further during the first nine months of 1939, being 2.9 per cent under the average for the corresponding months of 1938, and more than 50 per cent under the average for 1929.

In the field of passenger safety, 11 fatalities occurred to passengers in train accidents during the first three quarters of 1939, compared with 52 for the same period of 1938, and 8 fatalities to passengers in train-service accidents, compared with 13 for the comparable period of 1938. Nonfatal injuries to passengers in train and train-service accidents totaled 1,855 during the nine months of 1939 and 1,748 during the same months of 1938. The total casualty rate per hundred million passenger-miles was slightly less in 1939 than in 1938.

Casualties to employees on duty in the first three quarters of 1939 numbered 364 fatalities and 12,229 nonfatal injuries, compared with 358 fatalities and 11,801 nonfatal injuries during the same period of 1938. Total man-hours worked were 6.3 per cent greater for the 1939 period, so that the employee fatality rate per million man-hours worked declined 4.7 per cent and the nonfatal injury rate declined 2.4 per cent.

During the first nine months of 1939 there were 66 fewer accidents, 49 fewer fatalities, and 73 fewer nonfatal injuries in highway grade crossing accidents than for the corresponding nine months of 1938.

Taken as a whole, 81 fewer fatalities occurred in railroad accidents in the first three quarters of 1939 than in the same period of 1938. Nonfatal injuries increased 308 in number, while total casualties increased a little less than 1 per cent. This compares with an increase of 12.8 per cent in freight ton-miles and an increase of 4.9 per cent in passenger-miles during the same months.

Conclusion

In the light of the improved business experienced by the railways during the latter part of 1939, prospects for 1940 carry even more than usual interest. The significance of the situation may be indicated by the fact that had the railways during the whole of the year 1939 earned relatively as much net railway operating income as they did during the last six months of the year, their total net for the year would have amounted to about $750,000,000, instead of the $590,000,000 which they did earn.

Projecting the current situation into 1940, it is clear that a level of freight and passenger traffic in the coming year relatively as great as it was during the last six months of 1939 would produce at least 25 per cent more net than the carriers earned in 1939. Such a statement assumes that traffic continues at current levels, and that operating costs will not be too greatly affected by price changes—both of which assumptions are somewhat speculative, especially as inflation seems definitely on the way.

This is not to say that business will prove as good in 1940 as it has been since July 1, 1939. The actual level is still on the lap of the gods, and will be determined by the interplay of many and shifting political, social, psychological, and international factors, the trend of none of which can be foreseen at this time.

Over the whole world hangs the pall of war. Will it envelop more countries than it has yet overswept, or will the war continue as in the last four months, or will it be brought to a speedier end than now seems possible? Definite answers to these questions would throw considerable light on the probabilities for 1940, which at the moment are nothing but the vaguest possibilities.

Whatever may come, railways of the United States will continue to operate as servants of the public good, and will be ready to play their part in the national economy, in peace or in war, whatever that part may prove to be.

A $264,321 CONTRACT FOR AIR BRAKE EQUIPMENT has been awarded to the Westinghouse Air Brake Company by the Argentine State Railways, according to the United States Bureau of Foreign & Domestic Commerce, which reports that it co-operated with the office of the United States commercial attache at Buenos Aires in securing the order. The new air brake equipment is to be installed on rolling stock of the Central Cordoba line, a former British-owned road recently incorporated in the state-owned system. It replaces English-type vacuum brakes.

Bad News for Der Fuehrer—A Troop Train Loaded With Fighting Canadians Arriving at Halifax

Canada's Roads in Khaki Again

Are already handling greatly increased traffic and are preparing for mounting industrial and war load

By Railway Age's Ottawa Correspondent

THE war found the Canadian railroads fully prepared for the increased burden because they had been steadily expanding their equipment for rapidly improving business conditions, and it is no surprise that of the twelve months just closing the last four months, which have been the war months, showed a greater increase in gross revenue than the previous eight months. Complete statistics will not be available for two months but indications are that both the Canadian Pacific and the Canadian National will exceed the estimates made at the beginning of 1939.

Year End Sees Great Upsurge

Through the first week of December the cumulative totals of revenue car loadings for the year is 2,417,844 cars, as against 2,320,944 for the same period in 1938, but the real increase in cash business only began at the commencement of the latter half of the year. That improvement has been more marked in each succeeding month and the first week of December alone showed an advance for the Canadian National Railways of 30 per cent in gross revenue over the same period a year ago.

Excluding the war conditions which have naturally stimulated industrial production and have in many different ways increased railway business, the largest factor in the traffic rise was the bumper wheat crop in Western Canada. An indication of this is shown in the September traffic report which shows a total tonnage loaded of 10,179,323 in that month as against 6,663,546 in August and 7,799,284 in September last year. In Saskatchewan alone, the center of the wheat industry, there was in September this year a 100 per cent increase in the tonnage of agricultural products loaded.

The war has imposed heavy tasks on the railways, and especially for winter operations. There will be the movement of grain from interior elevators to seaboard, there will be the carriage of the largely increased industrial and mineral production, and the transportation of troops and war supplies. Most of this must inevitably go to the Atlantic seaboard and it means enlargement of trackage facilities and expansion of equipment, chiefly cars and locomotives.

To help the railways in speedy preparation for the war job the federal government recently advanced to the two railways the sum of $25,000,000. Of this total $10,000,000 went to the Canadian Pacific and the $15,000,000 to the Canadian National. It will be utilized chiefly for freight cars and locomotives, while additional sums have been spent by both roads in extension of trackage. The Canadian National spent $500,000 on lengthening passing sidings and on construction of a loop around the mountain near Truro, N. S., all of this work on the section of that road between Moncton, N. B., and Halifax.

Both roads have developed a large and lucrative busi-

ness in manifest freight movement between Toronto and Montreal. The trains are running in several sections and at express train speeds. This service permits of loading in the two cities as late as six o'clock in the evening with prompt morning delivery. It has proved one important reply to highway competition.

As in other national activities the railways have shown they have not forgotten the lessons learned from the last war. There has been prompt and efficient organization so that the transportation facilities can be used to their utmost. One of these steps was the naming by Transport Minister Howe of a Transport Controller, T. C. Lockwood of Montreal.

The duties of the Transport Controller are those of a priority officer—to prevent traffic congestion, and to assure the prompt movement of traffic important to the prosecution of the war. His functions, it is believed, will be exercised more in connection with export traffic than with domestic business. The office will, to a large extent, prevent delays at ocean ports, since one of the functions of the job is to exercise control over shipping, to cut down to a minimum the number of boats moving one way with little or no cargo.

As to the readiness of the railways to meet their responsibilities in the war, Transport Minister Howe in a recent address to the Engineering Institute said:

"In the year 1928 the railways of Canada handled 30 per cent more traffic than was handled in 1917, the peak of the war period, and did it without any sign of congestion or difficulty. What was done in 1928 can be done again. Even if Canadian railways were called upon to double the freight traffic effort of 1917, I have every confidence that it would be possible to meet even that emergency."

Sir Edward Beatty Foresees Busy R. R. Year

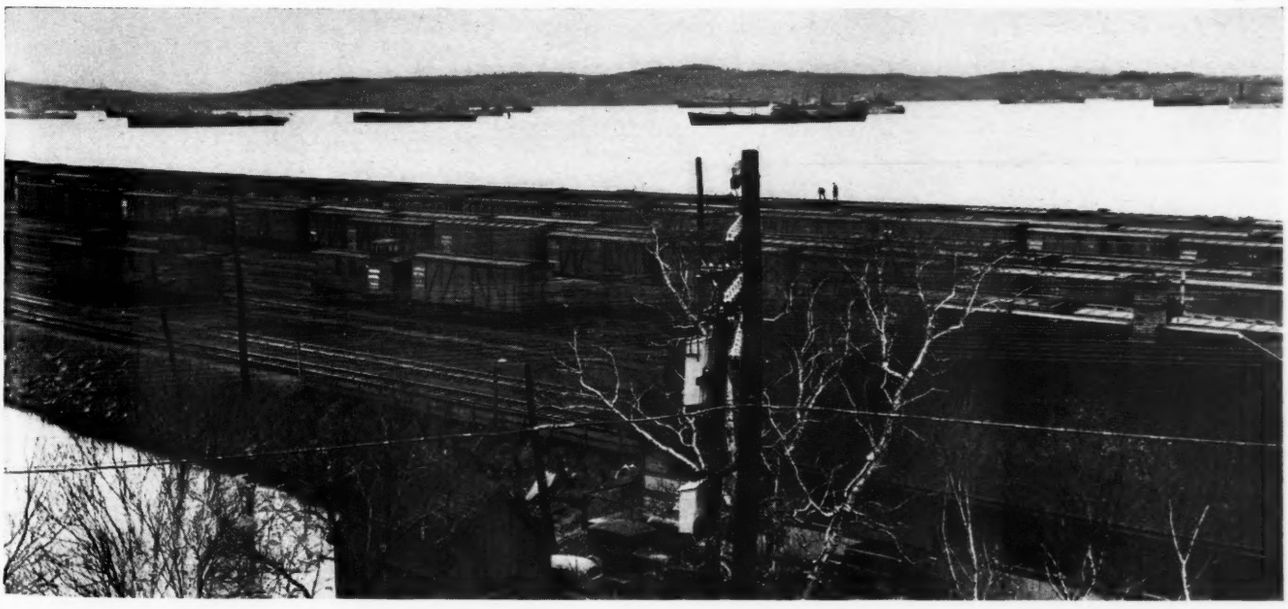
The chief executives of the country's principal railways—Sir Edward Beatty of the C. P. R., and S. J. Hungerford of the C. N. R. in their statements reviewing the past year's operations are modestly optimistic as to the outlook. That of Sir Edward follows in part:

"At the opening of 1939 there was every indication of a sustained movement towards general business recovery, and while the most optimistic of our expectations were not entirely fulfilled, the passing months witnessed definite and fairly steady improvement. The auspicious outlook for 1939 received confirmation from early prospects of excellent crops in the West, and as this hope was later fulfilled, business received considerable impetus. Undoubtedly this would have gone further than it did, had it not been for the worldwide apprehension consequent upon the evident determination of Germany to achieve her supremely selfish and illegal aims even at the cost of throwing the world back into the chaos and misery of a great war. This was the brake, and in the light of later events, it is perhaps well that it acted in that way. Had we gone into this war committed to wide domestic industrial expansion and to vast building projects the change over to war-time conditions would have brought far more dislocation and costly disruption than did take place.

"Comparing existing conditions with those in effect twelve months ago, it is encouraging to note that the Dominion Bureau of Statistics, for the first ten months of the year records an increase of 5 per cent in the purchasing power of the Canadian people, while industrial production is up 9 per cent, mineral production up 10 per cent and export trade up over 6 per cent. During later months this advance has been even more markedly maintained and, while actual figures are not immediately obtainable, we know that the year ends with a satisfactorily favorable balance of trade and a distinct increase in general employment.

"The railways have naturally profited by the general improvement, as is indicated by a recorded gain of 4.3 per cent in the car-loadings for the year reported up to December 16. This figure would have been still higher had it not been for congestion in the grain movement, later happily relieved.

"It was, on the whole, a favorable situation in which Canada found herself when war broke out, and moreover, when our statesmen and business leaders suddenly found themselves faced with its many and difficult problems, they had at their hands a vast wealth of valuable knowledge gained by dearly paid-for experiences of the previous conflict. The disruption of all foreign trade is bound to have important and far-reaching results and, doubtless, there will be many of them of a favorable nature, but such a world-wide dislocation of normal



Rockingham Yard, Halifax, Showing Ships in Bedford Basin Awaiting Convoy "Over There"

life as is now opening out cannot but be disastrous in its effect upon life in every corner of the world.

"In the opening days of the conflict there was the perhaps natural anticipation of an industrial war boom of great proportions. We should now realize with considerable satisfaction that such expectations are unlikely of complete fulfillment. Any such thing would increase the cost and difficulty of fighting the war, multiply the economic troubles of the mass of the people and tremendously add to complications attendant upon after-war transition to peace-time working and living.

"In-so-far as is possible, it is to be hoped events will so shape themselves that Canada may continue to conduct her domestic affairs upon the more or less normal lines that have been followed over the last quarter of 1939. So much depends upon the chances of war that any prophecies for the coming year are likely to prove futile. In a general way we should work towards and undoubtedly may expect increased production in most lines of industry, a heavier movement of general commodities and resultant benefit to the railways and to our steamship lines.

"Such conditions as these may be expected to bring about a period of something like prosperity, but behind it all there will be the war—a war for which we shall have to do a great deal of heavy paying. It would be more than unfortunate did such war-inspired prosperity as may come be allowed to blind us to the urgent necessity for exercise of drastic economy in all forms of public spending that are not made necessary by the war itself."

C. N. R. Net Up 233 Per Cent

In his review of 1939 and prospects for 1940 President Hungerford said in part:

"Traffic results for the year 1939 can be considered reasonably satisfactory. Preliminary figures indicate that the gross revenues of the Canadian National will exceed 200 million dollars for the first time since 1931. The recession in business activity which developed in 1938, continued in the early months of 1939, but was followed by an upswing in April. A larger than average crop in Western Canada gave further evidence of an improvement in general business conditions. The outbreak of war brought about a further traffic increase toward the close of the year, so that on the whole there has been a distinct increase in traffic receipts. While the audited revenue and operating expense figures are not yet available for the month of December, conservatively estimated results for that month added to the known figures for the first eleven months of the year indicate the following for the year 1939; actual results for 1938 are also shown for the purpose of comparison:

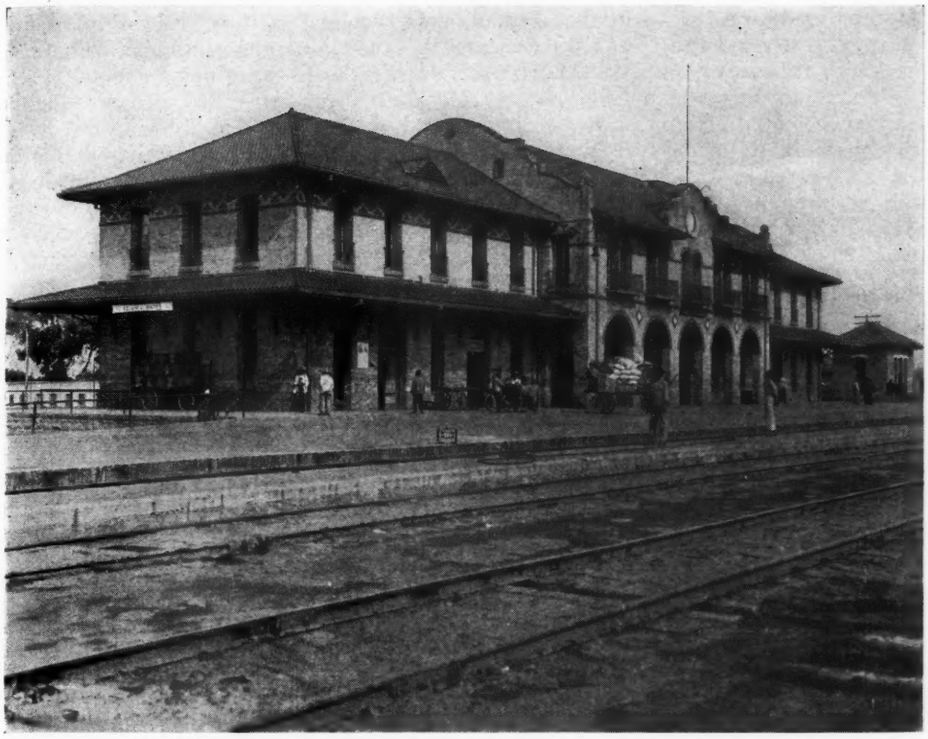
	Year 1939 Indicated Results	Year 1938 Actual Figures
Operating Revenues	$203,000,000	$182,241,723
Operating Expenses	183,000,000	176,175,313
Net Revenue	$ 20,000,000	$ 6,066,410
Operating Ratio	90.15%	96.67%

"During the year the normal process of modernizing equipment was carried on in all fields. Upon the outbreak of war the equipment situation was specially reviewed and special measures were taken for purchase of additional equipment to meet anticipated war requirements. Orders during the year consisted of 4,765 steel box cars, 500 flat cars, 100 refrigerator cars, 25 cabooses, 10 baggage cars, 5 mail and express cars, and 25 northern type locomotives. The program of air conditioning passenger equipment was continued and 493 cars owned by the Canadian National System are now equipped. In addition, all Pullman cars operating on the system under contract are air conditioned.

"Satisfactory progress has been made on the Montreal Terminal Development, work on which was resumed late in 1938. In accordance with the provisions of the co-operative agreement with regard to the railway hotel situation in Vancouver, the Vancouver Hotel Company, jointly owned by the Canadian National and Canadian Pacific, leased the new hotel constructed by the Canadian National and commenced operation in May of this year.

"The outlook for 1940 is largely influenced by war conditions. The traffic increases which have so far taken place may be expected to continue. This is likely to be true not only as regards the traffic particularly related to the war, but also as regards the industrial activity of the country. Railway operating revenues for 1940 are, therefore, likely to be substantially increased over the earnings of 1939 with consequent improvement in financial results."

Food for the Foes of Nazidom—A part of Canada's 1939 Bumper Wheat Crop in the C. N. R. Yard at Fort William



The Station and Office Building at Aguascalientes

Workers Operate Mexican Roads*

First full year of operation under new theory of management requires solving many problems

THE first full year of operation of the Mexican railways under the Workers' Administration resulted in the highest earnings of the railways' history. These were translated into what are termed as "fair" net operating results. The year was marred, however, by a number of serious accidents and by a deterioration in the on-time performance of trains. Two freight trains collided on January 1. On March 7, 1939, a Laredo-Mexico City passenger train collided head-on with a freight train near La Dalia. The most serious loss of life, however, occurred in a rear-end collision of two passenger trains at La Llave on April 13, when 35 passengers were killed and 50 seriously injured.

As a natural result of these accidents, which were attributed to lack of discipline, much unfavorable publicity was directed at the Workers' Administration. The general convention of railway employees immediately demanded and received the resignation of all general officers. However, after some deliberation, all but one of the officers were re-instated and he was retired on a pension.

The Union's influence in the Workers' Administration was severely criticized, and it agreed, under pressure, to take no further part in the affairs of the administration, leaving the workers' board and the general manager free to act on their own discretion and accept full responsibility for the application of proper discipline. The board of directors of the Workers' Administration was changed in mid-year to further improve discipline.

The new board is headed by the general manager, Salvador J. Romero, as chairman. The other members are D. S. Alonzo, the new general superintendent of transportation; Leandro Valdee, traffic manager; J. M. Campos, general superintendent of motive power; Manual Ceballos, chief engineer; Guillermo Lopez Espino, general accountant; and Leopoldo Cantu, general superintendent of express. Alfonso Saucedo serves as secretary of the new board.

Operating Results

On the brighter side of the picture is the continued increase in gross earnings, which permitted the administration to make a fairly good showing and the operating ratio was held below the figure of 85 per cent which was stipulated as the maximum by the federal government.

Gross operating earnings during the first eight months of 1939 amounted to $104,069,344, as against $96,841,159 in the same period of 1938; freight earnings increased from $68,140,378 in 1938 to $72,790,061 in 1939; passenger earnings increased from $18,271,029 to $19,144,506; baggage earnings from $8,172,050 to $8,668,798 and miscellaneous earnings increased from $2,146,099 to $3,354,719, while telegraph earnings decreased from $17,091 to $15,334.

Operating expenses were $85,187,621 in the first

* All monetary figures given in this article are quoted in Mexican pesos.

eight months of 1939, while in 1938 they were $81,046,251. The difference is attributed to increases reported in the different departments, with the exception of maintenance of way, which reduced its expense. Consequently the operating earnings increased from $15,794,907 to $18,881,722 and the operating ratio decreased from 83.69 to 81.86. Including earnings and expenses other than operating, the net earnings were increased from $13,061,705 to $17,473,714. Selected operating statistics for the first 10 months of 1939, compared with 1938, are shown on the table.

Comparative Operating Statistics

First 10 months, 1939-1938

	1938	1939	Inc.	Dec.
Locomotive kilometers	35,551,834	36,211,921	1.9	
Passenger train kilometers	10,437,561	10,629,216	1.8	
Freight train kilometers	13,957,320	14,660,558	5.0	
Mixed train kilometers	3,640,152	3,409,076		6.3
Total train kilometers	28,142,910	28,790,132	2.3	
Passenger car kilometers	85,428,860	87,198,152	2.1	
Freight car kilometers	193,436,570	201,203,388	4.0	
Empty car kilometers	96,308,463	97,531,000	1.3	
Total car kilometers	289,745,033	298,734,388	3.1	
All cars handled	436,829	444,144	1.7	
Net ton kilometers	4,830,769,000	5,014,827,000	3.8	
Gross ton kilometers	11,617,473,000	11,908,645,000	2.5	
Kilometers per car per day	52.2	57.6	10.3	
Freight net ton kilometers per kilometer in operation	1,196	1,242	3.8	
Average tons per car	24.97	24.92		0.2
Freight train speed (K.P.H.)	23.1	23.3	0.9	
Kilometers per locomotive day (freight)	179	187		3.0
Kilometers per locomotive day (passengers)	234	227		
Kilometers operated	13,281	13,281		
Gross ton kilometers per train hour	17,043	17,095	0.3	

Distribution of Net Railway Earnings

To the net railway earnings of $17,473,714 must be added the sum of $4,439,845, recovered from the previous administration on account of pending bills collectible, which brings the total to $21,913,560, which was disposed of as follows: for additions and betterments, $12,566,643; floating debt paid on account of the previous administration, $4,546,378; loans to the Interoceanic for operating expenses, $4,067,029 making a total of $21,180,050.38, and leaving a balance of cash on hand of $733,509.87.

The increase in gross earnings, which resulted in a corresponding trend in net earnings, permitted the Workers' Administration to meet obligations in excess of its commitments, especially in regard to additions and betterments, the total investment in which amounted to $12,566,643 during the first eight months of 1939. Of this total $4,861,761 was invested in tracks, buildings, structures and rolling stock and $7,704,881 was used in payment for new locomotives purchased in the United States. This represents an expenditure of nearly twice the legal requirement which, under the present set-up, provides that at least 5.64 per cent of the gross earnings (in this case $6,566,459) be expended for additions and betterments.

Labor Costs

Owing to salary readjustments and particularly because of increases granted to low salaried shopmen, whose wages were raised $2,500,000 in August, labor costs have followed a rising trend. Material costs have also risen on account of higher rate of exchange affecting imported materials. The following data are indicative of the higher costs.

During the 12 months ending with September, 1939, passenger car labor repairs increased from $168.74 per car in 1938 to $169.89 per car in 1939, and materials increased from $121.83 per car to $138.39 in 1939; on the other hand, labor costs for maintenance decreased from $20.84 to $20.05 per 1,000 kilometers run, but materials increased from $15.05 to $16.34. Labor costs for repairing freight cars during the same period increased from $20 to $21.69, and the costs of materials increased in the same period from $18.74 to $24.18. Maintenance of such equipment decreased from $15.39 to $15.07 per 1,000 kilometers run as to labor, and increased from $14.43 to $16.81 as to materials. Labor costs for backshop locomotive repairs increased from $176.58 to $184.67 per 1,000 kilometers and materials increased from $96.04 to $122.47. Ordinary maintenance repair costs this year were $141.47 as against $138.67 last year for labor, and material costs rose from $33.46 to $34.33.

The employees of the National of Mexico, in accordance with the labor contracts in force, are entitled to 15 days vacation each year, but it has been the custom for some years past to pay the equivalent in cash and most of the employees do not make use of vacations.

Although freight earnings increased 6.8 per cent, the freight traffic, stated in number of tons handled, increased only 2.2 per cent, due to heavy decreases in

A High Bridge Over the Tula River

shipments of low class freight, such as coal, coke, lumber and minerals, which offset the increases reported in higher class freight. Coal shipments were reduced considerably due to decreases in production after the mines at Rosita and Palay, in the state of Coahuila, were turned over to the workers to operate on the co-operative system. The accompanying table shows details as to the classification of traffic handled on the National Lines of Mexico, and the volume is shown by classifications. While 11 classifications report decreases, 17 show increases, and the total tonnage handled in the first nine months of 1939 amounted to 7,555,964, as compared with 7,390,256 in the same period of 1938, an increase of 165,708 tons.

Classified Freight Transported, in Tons

(9 Months 1939-1938)

Articles	1939	1938	Inc.	Dec.	Inc.	Dec.
Rice	22,526	29,568		7,042		23.8
Fuel Oil	360,129	296,777	63,352		21.35	
Cotton	48,997	63,981		14,984		23.4
Sugar	206,965	212,628		5,663		2.7
Coffee	35,497	36,593		1,096		3.0
Coal	309,599	418,594		108,995		26.0
Charcoal	114,461	97,694	16,767		17.16	
Cement	200,322	172,331	27,991		16.2	
Beer	89,825	74,204	15,621		21.1	
Coke	195,001	214,838		19,837		9.2
Construction steel	49,124	53,863		4,739		8.8
Fruits & Vegetables	439,496	508,440		68,944		13.6
Beans	49,951	46,139	3,812		8.3	
Gasoline	184,628	172,729	11,899		6.9	
Cattle	158,116	124,059	34,057		27.5	
Flour	71,784	63,003	8,781		1.39	
Lumber	215,494	225,935		10,441		4.6
Corn	300,014	272,763	27,251		10.0	
Lard	14,136	15,052		916		6.1
Machinery	170,597	23,977	146,620		611.5	
Bullion	222,998	214,493	8,505		4.0	
Petroleum	369,672	350,826	18,846		5.4	
Minerals	917,202	954,264		37,062		3.9
Pulque	98,479	73,336	25,143		34.3	
Tobacco	9,967	7,894	2,073			
Wheat	245,523	221,349	24,174	10.9	26.3	
Salt	75,597	60,884	14,713		24.2	
Wines & Liquors	15,030	13,731	1,299		9.5	
Miscellaneous	2,364,834	2,370,311		5,477		0.2
Total	7,555,964	7,390,256	165,708		2.2	

Notwithstanding unfavorable currency exchange conditions, imports to Mexico showed an increase of 945 cars, or 13.6 per cent, through the four international railway interchange points; and an increase of 2,609 cars, or 105.3 per cent, through the three seaports. Contrary to expectations, exports decreased 101 cars, or 0.9 per cent, through the gateways, and 1,854 cars, or 13 per cent, through the ports.

* * * *

Organization Matters

The treasury department continues to be under the direct control of the general accountant and a general cashier, as a treasurer has not as yet been appointed. Payments, however, are supervised to a certain extent by two comptrollers appointed by the treasury department of the federal government. The personnel and publicity departments also continue to function as sections of the general manager's office, as the chiefs of these departments have not been appointed.

A department of locomotives was created on July 16, 1939, with Pedro de Leon Palacios as general superintendent of locomotives. All the former assistant division superintendents who were in charge of locomotive service were appointed assistant general superintendents of locomotives.

The general functions of this department are the assignment and distribution of locomotives; assignment of locomotive mileage; discussion and recommendation as to reforms, conversion and purchase of locomotives; supervision of the purchase and delivery of fuel and lubricants; supervision of water and sand for locomotives, and technical control of enginemen, as to the handling of locomotives, and the examination and discipline of such personnel.

Loaded Cars Interchanged

Number of Cars (9 Mos. 1939-1938)

	Imports		Exports	
	1939	1938	1939	1938
Laredo	5,094	4,270	5,460	4,719
El Paso	1,524	1,840	4,214	5,616
Eagle Pass	1,032	796	811	929
Brownsville	253	52	972	294
Totals	7,903	6,958	11,457	11,558
Water Ports				
Tampico	1,919	740	7,311	11,183
Vera Cruz	1,690	1,282	5,041	3,024
Manzanillo	1,478	456	9	8
Totals	5,087	2,478	12,361	14,215

One of an Order for 500 Fifty-Ton Box Cars Built for the Western Maryland by the Pressed Steel Car Co., Inc. The Light Weight Is 47,500 Lb.

Financial Barometer Still Low

Investors not "railroad minded" except as to equipment issues, and sad market figures mirror their gloom

By J. G. Lyne

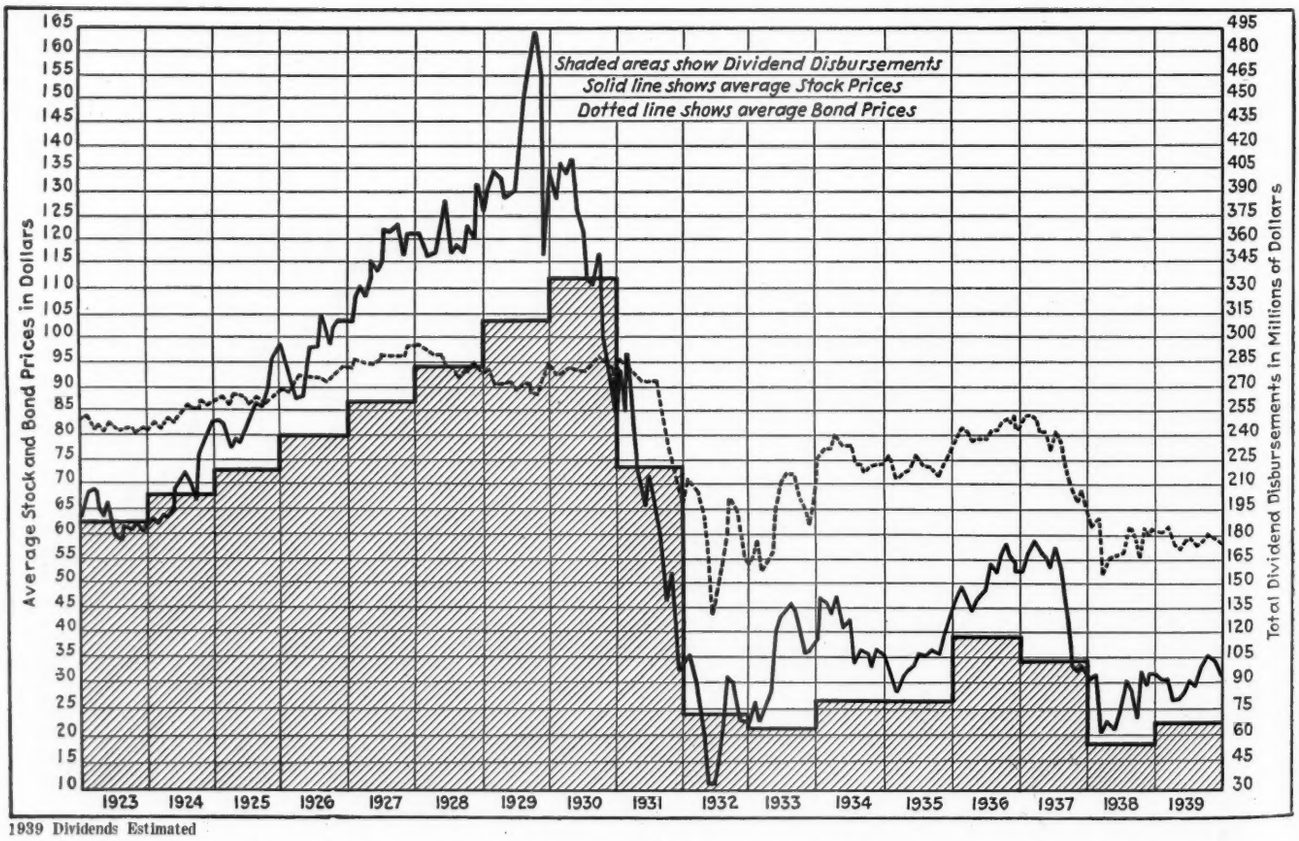
Assistant to Editor

IF an investor had gone into the market toward the end of December and divided his money equally in the acquisition of common stocks of five leading railroads still paying dividends, the average interest he would have earned on the basis of 1939 dividends, would have been 7.4 per cent. If, instead, he had taken his money and divided it among common stocks of some of the top-notch industrials (a motor company, a food corporation, an electrical manufacturing concern, a steel company and a phone company—chosen at random), the average yield on his investment would have been only 4.3 per cent.

What Makes the Investor Timid?

The persistence of the depression is ascribed by most qualified observers to the reluctance of investment capital to take risks, because the prospect of profit from such ventures has been so thoroughly removed by the politicians—by high and uncertain taxation, by meddlesome regulation and by the threat of increased government competition. It is evident from the relatively high regard in which the capital market holds industrial issues, in comparison with its opinion of even the best railroad stocks, that the political forces destructive to private investment are far stronger in the railroad sector than in the industrial area. And yet the spokesmen for Big Business (to wit, the National Association of Manufacturers) are quite satisfied with the political *status quo* for the railroads, while they wax eloquently critical at the less intolerable indignities to which private enterprise other than the railroads are subjected. It is as if one should denounce Hitler's comparatively bloodless Austrian *Anschluss,* while condoning his conquest of Poland.

There is one school of financial commentators who contend that the railroads' financial difficulties will be ended once they reorganize their financial structures to conform to the reduced ratio of the national traffic they are now called upon to handle. The high yield from present market prices of railroad stocks which still pay dividends, however, proves the inadequacy of this "put-them-through-the-wringer" panacea. Investors — at a time when "safe" investments will yield them only about a 2 per cent return, demand better than 7 per cent on the average before they will put their money into the best



1939 Dividends Estimated

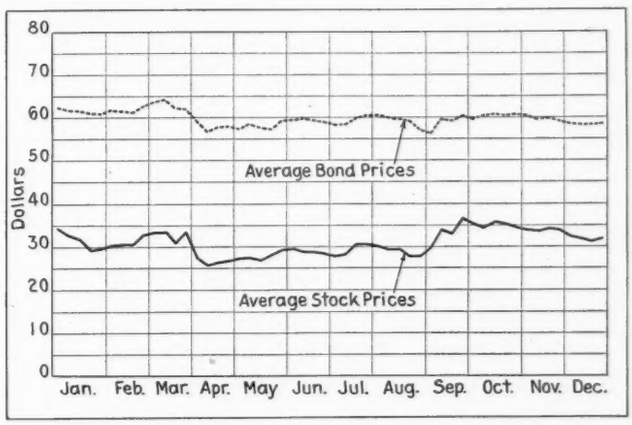
Average Prices of 20 Representative Stocks and 20 Bonds with Dividends Shown on Same Relative Scale

common stocks that the railroads can offer. The error the "wringer" school makes is in assuming that the diversion of traffic away from the railroads is something which has come and gone; and that all the roads need to do is to write off the damage done and go forward into prosperity on a new level of traffic and earnings. They neglect to consider that the Youngstown and St. Lawrence canals and other grandiose waterway projects, and the elaborate plans of the Public Roads Administration for a system of nation-wide toll-free superhighways connecting all centers of population hang over the railroad industry like the sword of Damocles.

Status of Railroad Loans by the R. F. C., October 31, 1939

	Disbursed	Repaid
Aberdeen & Rockfish	$127,000	$127,000
Alabama, Tennessee Northern	275,000	90,000
Alton	2,500,000	648,872
Ann Arbor (Recrs.)	634,757	459,757
Ashley, Drew & Northern	400,000	400,000
Baltimore & Ohio	95,343,399	12,201,300
Birmingham & Southeastern	41,300	41,300
Boston & Maine	11,069,437	41,806
Buffalo, Union Carolina	.....	.....
Carlton & Coast	535,800	139,908
Carolina, Clinchfield & Ohio Railway	14,150,000	.....
Central of Georgia	3,124,319	220,691
Central of New Jersey	464,298	464,298
Charles City Western	140,000	36,000
Chicago & Eastern Illinois	5,916,500	155,032
Chicago & North Western	46,588,133	4,338,000
Chicago Great Western	1,289,000	838
Chicago Great Western (Trustees)	150,000	150,000
Chicago, Milwaukee, St. Paul & Pacific Co.	11,500,000	537
Chicago, Milwaukee, St. Paul & Pacific (Trustees)	3,840,000	3,840,000
Chicago, North Shore & Milwaukee	1,150,000	.....
Chicago, Rock Island & Pacific	13,718,700	.....
Cincinnati Union Terminal	8,300,000	8,300,000
Colorado & Southern	29,450,800	1,561,133
Columbus & Greenville	.....	.....
Copper Range	53,500	53,500
Delaware, Lackawanna and Western	2,000,000	.....
Denver & Rio Grande Western	8,081,000	500,000
Denver & Rio Grande Western (Trustees)	1,800,000	1,800,000
Denver & Salt Lake Western	3,182,150	71,300
Erie	16,582,000	582,000
Eureka-Nevada	.....	.....
Florida East Coast (Recrs.)	627,075	627,075
Fort Smith & Western (Recrs.)	227,434	10,000
Fort Worth & Denver City	8,176,000	.....
Fredericksburg & Northern	.....	.....
Gainesville Midland	78,000	.....
Gainesville Midland (Recrs.)	.....	.....
Galveston, Houston & Henderson	3,183,000	1,111,000
Galveston Terminal	546,000	.....
Georgia & Florida (Recrs.)	354,721	.....
Great Northern	6,000,000	6,000,000
Green County	13,915	13,915
Gulf, Mobile & Northern	520,000	520,000
Illinois Central	35,290,000	125,000
Lehigh Valley	9,278,000	8,500,000
Litchfield & Madison	800,000	800,000
Maine Central	2,550,000	2,550,000
Maryland & Pennsylvania	197,000	50,000
Meridian & Bigbee River (Trustee)	985,000	.....
Minneapolis, St. Paul & Sault Ste. Marie	6,843,082	6,843,082
Mississippi Export	100,000	100,000
Missouri-Kansas-Texas	5,124,000	2,309,760
Missouri Pacific	23,134,800	.....
Missouri Southern	99,200	99,200
Mobile & Ohio	785,000	785,000
Mobile & Ohio (Recrs.)	1,070,599	1,070,599
Murfreesboro-Nashville	25,000	.....
New York Central	27,499,000	27,499,000
New York, Chicago & St. Louis	18,200,000	18,200,000
New York, New Haven & Hartford	7,699,778	809,888
Norfolk Southern (Recrs.)	.....	.....
Pennsylvania	28,900,000	28,900,000
Pere Marquette	3,000,000	3,000,000
Pioneer & Fayette	17,000	12,000
Pittsburgh & West Virginia	4,975,207	773,600
Puget Sound & Cascade	300,000	300,000
St. Louis-San Francisco	7,995,175	2,805,175
St. Louis-Southwestern	18,672,250	18,672,250
Salt Lake & Utah (Recrs.)	200,000	200,000
Salt Lake & Utah	400,000	.....
Savannah & Atlanta	965,000	.....
Sand Springs	162,600	162,600
Seaboard Air Line (Recrs.)	640,000	320,000
Southern Pacific	44,000,000	24,200,000
Southern	50,905,000	17,909,132
Sumpter Valley	100,000	100,000
Tennessee Central	5,147,700	147,700
Texas, Oklahoma & Eastern	.....	.....
Texas & Pacific	700,000	700,000
Texas-Southeastern	30,000	30,000
Tuckerton	39,000	39,000
Wabash (Recrs.)	22,833,383	991,800
Western Pacific	4,366,000	1,403,000
Western Pacific (Trustees)	13,502,921	3,600,000
Wichita Falls & Southern	750,000	400,000
Wrightsville & Tennille	22,525	22,525
Totals	$650,437,461	$218,936,178

Investment money for equipment, which will be paid back in ten or fifteen years, is more plentiful and cheaper today than it has ever been in history — but "long run" investment confidence in the industry just does not exist. Industrial investors can at least take heart from the hope that politicians who injure industry may be replaced by others with "conservative" views;



Fluctuations in Average Prices of Twenty Representative Railroad Stocks and Twenty Bonds in 1939

but railroad investors get no such encouragement because the threats to the future of the railroad industry arise even more from the machinations of alleged "conservatives" than they do from admitted radicals. As a matter of fact, there are few if any moves being made by effective radicals which directly threaten the future of investments in the railroad industry. Recently in Congress a number of politicians long known as radicals exerted themselves to remove some of the unfair competitive disadvantages under which the railways labor, whereas, by contrast, such leading representatives of business opinion as the Chamber of Commerce of the United States and the National Association of Manufacturers refuse to take any steps to uphold the principles of private enterprise in transportation.

Why the Doldrums Persist

The preceding paragraphs lead inevitably to the corollary that the railroads have gone through another year of stalemate and frustration on the financial side. No new money from outside investors has gone into the industry (except for equipment and for some limited refinancing). Capital improvements, except for equipment, are restricted to those which the carriers can finance out of their meager earnings. Reorganization of bankrupt companies is delayed because holders of junior securities object to being frozen out irreparably when they realize that the losses they are asked to accept arise only in part from intrinsic disappearance of value, but in even greater measure because the railroads are being squeezed by political forces; and they see clearly that the harm done by politics is not irreparable, because political policies are subject to change. Perhaps if these beleaguered junior security holders of bankrupt companies would hire as high-grade publicity talent to plead their cause before public opinion as they have done in the employment of legal skill to speak for them before the I. C. C. and the courts, their case might appear brighter.

Equipment trust issues, the only bright side of the current situation in railroad finance, are dealt with in a summary subjoined hereto. Bond issues—wholly re-

Railway Securities Sold by Public Offering in 1916 and 1920 to 1939

Year	Bonds	Notes	Stock	Total R. R. financing	Total all financing	Per Cent R. R. to total
1916	$229,000,000	$126,000,000	$16,000,000	$371,000,000	$1,864,000,000	19.9
1920	194,583,000	193,840,000	3,737,000	392,160,000	3,324,922,000	12.1
1921	455,125,000	202,928,300	27,222,500	685,275,800	2,780,874,000	24.6
1922	299,025,800	288,936,500	27,068,100	615,030,400	3,200,176,000	19.2
1923	165,956,000	354,720,500	59,140,850	579,817,350	3,602,704,000	16.0
1924	620,347,000	351,276,200	11,000,000	982,623,200	4,185,590,000	23.5
1925	374,020,500	151,753,740	30,934,430	556,708,670	5,234,992,000	10.6
1926	241,954,000	172,477,000	41,577,200	456,008,200	5,746,354,000	7.9
1927	686,939,500	89,184,600	210,596,900	986,721,000	7,830,641,000	12.6
1928	525,719,000	79,911,000	187,369,100	792,999,100	8,473,880,000	9.4
1929	418,984,000	180,322,000	275,269,240	874,575,240	11,007,170,000	7.9
1930	800,694,000	142,168,000	63,805,600	1,006,667,600	5,920,498,000	17.0
1931	453,824,000	105,209,000	.....	559,033,000	2,730,082,000	20.5
1932	11,827,000	13,125,000	.....	24,952,000	684,806,000	3.6
1933	12,000,000	.....	.....	12,000,000	335,812,000	3.6
1934	172,074,000	71,068,000	.....	243,142,000	618,627,000	39.3
1935	107,746,000	57,372,000	.....	165,118,000	2,190,093,550	7.6
1936	592,254,000	77,580,000	.....	669,834,000	4,061,901,025	16.5
1937	60,547,000	100,500,000	.....	161,047,000	1,589,043,484	10.1
1938	60,000,000	22,270,000	.....	82,270,000	1,635,196,000	5.0
1939*	21,800,000	47,365,000	.....	69,165,000	1,848,933,160	3.7

* 11 Months Total as Compiled by Dow Jones & Co.

financing—consisted almost entirely of guaranteed issues, until December 29 when bankers offered $30,000,000 of 10-year, 3½ per cent collateral trust bonds, and an equal amount of 20-year, 4 per cent bonds of the Louisville & Nashville at 101 and 100½ respectively. Previously an issue of $12,000,000 guaranteed 3⅜ per cent 30-year bonds of the Cincinnati Union Terminal had been sold by bankers at a price to yield 3 per cent; and $7,000,000 of 3⅜ per cent 36-year guaranteed bonds of the Terminal Railroad Association of St. Louis had been offered at 102.6 by bankers. Earlier in the year, Canadian banks sold $50,000,000 of Canadian National notes, guaranteed by the Dominion government, priced to yield 2.4 per cent for a 7-year maturity and 3.19 per cent for 20 years.

There were, of course, no new issues of stock under such conditions as prevailed in 1939—the only activity in this sector being a 5-to-1 split-up of the $100-par stock of the Cincinnati, New Orleans & Texas Pacific, reducing the par value to $20, and a 4-to-1 split-up in the common stock of the Virginian.

Receiverships and Trusteeships Established in 1939

Name of Road	Mileage Operated	Long Term Debt Outstanding	Capital Stock Outstanding
Central Railroad of New Jersey..	710	$49,531,000	$27,436,800
Collins & Glennville.....	23	None	30,000
Northern Railroad of New Jersey	...	861,000	1,000,000
Total three companies.....	733	$50,392,000	$28,466,800

Indebtedness to Uncle Sam Rises

There was a slight increase in the net advances received by the railroads from the Reconstruction Finance Corporation at the end of October, compared with a year ago (details given in an accompanying table). Several equipment trust issues are also to be financed by the R. F. C. under somewhat more liberal terms than it has offered heretofore, and these will cause the total of government financing to rise. On the other hand, such loans are fully secured and do not represent "distress financing" as did the bulk of the earlier loans made by the R. F. C. The corporation disposes of these equipment obligations in the open market whenever conditions are favorable and has profited considerably therefrom.

Railroads Taken from Receivership or Trusteeship During 1939

Name of Road	Mileage Operated
Alabama & Western Florida.....	38
Bamberg, Ehrhardt & Walterboro.....	14
Fort Smith & Western.....	250
Louisiana & North West.....	99
Total	401

Dividend changes during the year were of minor importance, and consisted principally of larger disbursements toward the end of the year by a few of the carriers which are still paying dividends. Some of the major changes were the following:

Dividend Changes

The Virginian declared in December a special dividend of $4 on its old $100-par common stock (being split 4 ways), the stock paying regularly $2 each quarter.

Mileage in the Hands of Receivers or Trustees

(Figures to 1938, Inclusive, from I. C. C. Statistics for Year Ended December 31, 1938. Figures for 1939 Compiled by *Railway Age*.)

Year ended	Miles of road operated by receivers or trustees at close of year	Net change during year in miles of road operated	No. of roads in charge of receivers or trustees at close of year
June 30, 1894.....	40,819	.....	192
1895	37,856	−2,963	169
1896	30,475	−7,380	151
1897	18,862	−11,614	128
1898	12,745	−6,117	94
1899	9,853	−2,892	71
1900	4,178	−5,675	52
1901	2,497	−1,681	45
1902	1,475	−1,022	27
1903	1,185	−290	27
1904	1,323	+138	28
1905	796	−527	26
1906	3,971	+3,176	34
1907	3,926	−45	29
1908	9,529	+5,603	52
1909	10,530	+1,001	44
1910	5,257	−5,273	39
1911	4,593	−664	39
1912	9,786	+5,193	44
1913	16,286	+6,500	49
1914	18,608	+2,322	68
1915	30,223	+11,615	85
1916	37,353	+7,130	94
Dec. 31, 1916.....	34,804	−2,550*	80
1917	17,376	−17,428	82
1918	19,208	+1,832	74
1919	16,590	−2,618	65
1920	16,290	−300	61
1921	13,512	−2,778	68
1922	15,259	+1,747	64
1923	12,623	−2,636	64
1924	8,105	−4,518	61
1925	18,687	+10,582	53
1926	17,632	−1,055	45
1927	16,752	−880	40
1928	5,256	−11,496	33
1929	5,703	+447	29
1930	9,486	+3,783	30
1931	12,970	+3,484	45
1932	22,545	+9,575	55
1933	41,698	+19,153	78
1934	42,168	+470	80
1935	68,345	+26,177	87
1936	69,712	+1,367	91
1937	70,884	+1,172	109
1938	76,938	+6,054	109
1939	76,801	−137	108

* Represents decrease for six months.

Summary of Railroad Receiverships and Trusteeships, 1876 to 1939

Year	Roads Placed in Receivership or Trusteeship: Number of roads	Miles	Bonds and stocks	Roads Taken from Receivership or Trusteeship *: Number of roads	Miles	Bonds and stocks
1876	42	6,662	$467,000,000	30	3,840	$217,848,000
1877	38	3,637	220,294,000	54	3,875	198,984,000
1878	27	2,320	92,385,000	48	3,906	311,631,000
1879	12	1,102	39,367,000	65	4,909	243,288,000
1880	13	885	140,265,000	31	3,775	263,882,000
1881	5	110	3,742,000	29	2,617	137,923,000
1882	12	912	39,074,000	16	867	65,426,000
1883	11	1,990	108,470,000	18	1,354	47,100,000
1884	37	11,038	714,755,000	15	710	23,504,000
1885	44	8,836	385,460,000	22	3,156	278,394,000
1886	13	1,799	70,346,000	45	7,687	374,109,000
1887	9	1,046	90,318,000	31	5,478	328,181,000
1888	22	3,270	186,814,000	19	1,596	64,555,000
1889	22	3,803	99,664,000	25	2,930	137,815,000
1890	26	2,963	105,007,000	29	3,825	182,495,000
1891	26	2,159	84,479,000	21	3,223	169,069,000
1892	36	10,508	357,692,000	28	1,922	95,898,000
1893	74	29,340	1,781,046,000	25	1,613	79,924,000
1894	38	7,025	395,791,000	42	5,643	318,999,000
1895	31	4,089	369,075,000	52	12,831	761,791,000
1896	34	5,441	275,597,000	58	13,730	1,150,377,000
1897	18	1,537	92,909,000	42	6,675	517,680,000
1898	18	2,069	138,701,000	47	6,054	252,910,000
1899	10	1,019	52,285,000	32	4,294	267,534,000
1900	16	1,165	78,234,000	24	3,477	190,374,000
1901	4	73	1,627,000	17	1,139	85,808,000
1902	5	278	5,835,000	20	693	39,788,000
1903	9	229	18,823,000	13	555	15,885,000
1904	8	744	36,069,000	13	524	28,266,000
1905	10	3,593	176,321,000	6	679	20,307,000

Year	Roads Placed in Receivership or Trusteeship: Number of roads	Miles	Bonds and stocks	Roads Taken from Receivership or Trusteeship *: Number of roads	Miles	Bonds and stocks
1906	6	204	$55,042,000	8	262	$10,400,000
1907	7	317	13,585,000	6	114	13,777,000
1908	24	8,009	596,359,000	3	138	2,547,000
1909	5	859	78,095,000	12	2,629	250,033,000
1910	7	735	51,427,500	17	1,100	93,660,109
1911	5	2,606	210,606,882	13	1,386	40,741,543
1912	13	3,784	182,112,497	12	661	25,910,990
1913	17	9,020	477,780,820	6	1,159	86,163,850
1914	22	4,222	199,571,446	9	1,470	83,189,500
1915	12	20,143	1,070,808,628	11	3,914	285,258,782
1916	9	4,439	208,159,689	26	8,355	703,444,855
1917	19	2,486	61,169,962	20	10,963	557,846,348
1918	8	3,519	242,090,800	11	763	24,735,187
1919	7	244	11,886,779	8	459	15,479,587
1920	10	541	21,620,150	7	380	7,676,200
1921	14	1,744	63,872,113	11	4,173	306,123,942
1922	12	4,330	329,114,860	15	6,151	299,491,646
1923	10	2,218	87,913,581	8	637	14,622,900
1924	11	920	30,223,372	14	3,992	269,251,082
1925	6	11,368	680,422,080	6	638	9,965,000
1926	6	88	2,821,400	12	12,852	626,662,708
1927	6	924	45,236,674	5	142	4,254,000
1928	1	19	529,000	4	209	6,393,250
1929	3	634	30,981,391	5	562	20,715,065
1930	4	4,752	277,323,994	2	1,048	124,668,500
1931	19	5,195	432,151,526	2	102	993,860
1932	13	11,817	626,577,314	8	394	8,575,178
1933	18	21,222	1,229,678,183	2	298	16,133,000
1934	1	81	460,000	2	40	1,598,600
1935	16	29,018	2,182,979,167	5	436	9,146,800
1936	4	8	43,026,400	3	122	7,507,961
1937	23	1,937	186,136,861	2	179	5,455,810
1938	9	6,194	660,997,669	8	290	.....
1939	3	733	78,858,800†	4	401	.....

* Prior to 1938 these figures covered foreclosure sales only.
† Represents long term debt and stock outstanding.

The Louisville & Nashville in November declared a dividend of $2.75 on its common stock, bringing the year's total disbursement to $5, as compared with $4 paid in 1938.

The Atlantic Coast Line in October resumed its preferred dividend, declaring $2.50 per share—the last previous disbursement having been made a year previously.

The Chesapeake & Ohio in November declared a quarterly dividend of 62½ cents on its $25-par common stock, having paid 50 cents previously. An extra dividend of 50 cents was also paid on this stock.

The Cincinnati, New Orleans & Texas Pacific in November declared a $4 dividend on its new $20-par common stock. In June a $10 dividend was paid on the old $100-par stock, which has been split 5 to 1.

The Norfolk & Western in November declared an extra dividend of $5 on its common stock (which pays $2.50 quarterly). No extra dividend was paid in 1938.

The Pennsylvania paid $1 on its common stock ($50-par) in 1939, compared to 50 cents in 1938.

The Pittsburgh & Lake Erie paid $3 on its $50 common stock in November, compared to a previous disbursement of 50 cents in June. In 1938 disbursements totaled $1.75.

The Wheeling & Lake Erie in December declared a dividend of $4 per common share, the last previous payment having been $5 in 1937.

The Alabama Great Southern paid $8 on both its preferred and ordinary stocks during the year, as compared with $6 in 1938.

One More Class I Bankruptcy

There were no important reorganizations of bankrupt properties actually accomplished during the year, although final plans for two or three were nearing adoption

Railroads in the Hands of Receivers or Trustees on December 31, 1939

Road	Mileage operated	Mileage owned	Date of receivership or trusteeship	Long term debt outstanding‡	Capital stock outstanding‡	Total old company securities‡	Receiver's or trustee's certificates outstanding
Akron, Canton & Youngstown	171	19	Apr. 4, 1933	$3,577,000	$1,500,000	$5,592,621	$228,000
Northern Ohio	....	152	Apr. 4, 1933	3,300,000	4,230,000	7,530,000	None
Alabama, Tennessee & Northern	218	215	Dec. 14, 1934	3,783,789	3,916,560	8,028,140	73,388
Burlington, Muscatine & Northwestern	11	11	Nov. 15, 1937	None	None	None	None
California & Oregon Coast	15	15	Feb. 19, 1925	209,226	350,000	559,226	25,000
Central of Georgia	1871	1412	Dec. 19, 1932	54,072,000	20,000,000	78,847,417	1,986,000
Central Railroad of New Jersey	710	389	Oct. 30, 1939	49,531,000	27,436,800	76,967,800	None
Chicago & Eastern Illinois	927	808	Sept. 16, 1933	34,797,036	45,891,400	88,149,180	141,000
Chicago & North Western	8329	8096	June 28, 1935	331,289,700	180,835,300	544,997,499	None
Chicago, Attica & Southern	155	140	Aug. 4, 1931	441,200	2,294,452	2,735,652	None
Chicago Great Western	1505	995	Mar. 1, 1935	39,901,564	91,282,900	133,566,511	None
Chicago, Indianapolis & Louisville	549	520	Dec. 30, 1933	26,323,681	15,488,300	45,305,095	None
Chicago, Milwaukee, St. Paul & Pacific	10890	9910	June 29, 1935	463,342,516	224,409,752	691,252,268	14,562,491
Chicago, Rock Island & Pacific	7839	5087	June 7, 1933	249,291,000	128,892,512	396,027,212	27,942,800
Chicago, Rock Island & Gulf	....	635	Oct. 31, 1933	None	None	None	None
Choctaw, Oklahoma & Gulf	....	826	Oct. 31, 1933	8,935,000	None	8,935,000	None
Peoria Terminal	32*	30*	Oct. 31, 1933	930,000	None	930,000	None
Rock Island, Arkansas & Louisiana	....	376	Aug. 31, 1933	11,453,600	None	11,453,600	None
Rock Island, Memphis Terminal	....	6*	Oct. 31, 1933	None	None	None	None
Rock Island, Omaha Terminal	....	3*	Oct. 31, 1933	None	None	None	None
Rock Island, Stuttgart & Southern	....	21	Oct. 31, 1933	None	None	None	None
St. Paul & Kansas City Short Line	....	417	Aug. 31, 1933	9,984,355	None	9,984,355	None
Chicago, Springfield & St. Louis	87	79	Jan. 24, 1930	500,000	204,960	704,960	None
Collins & Glennville	23	23	June 1, 1939	None	30,000	30,000	None
Denver & Rio Grande Western	2580	2286	Nov. 1, 1935	127,585,480	16,445,600	147,791,724	5,000,000
Denver & Salt Lake Western	....	38	Nov. 1, 1935	157,636	3,631,000	6,899,486	None

Footnotes with Remainder of Table on Following Page

Railroads in the Hands of Receivers or Trustees on December 31, 1939—Continued

Road	Mileage operated	Mileage owned	Date of receivership or trusteeship	Long term debt outstanding‡	Capital stock outstanding‡	Total old company securities‡	Receiver's or trustee's certificates outstanding
Duluth, South Shore & Atlantic	550	447	Jan. 1, 1937	23,521,000	22,000,000	45,521,000	None
Mineral Range	26	26	June 1, 1937	1,909,746	1,500,000	3,409,746	None
Erie	2148	856	Jan. 19, 1938	255,757,568	214,913,100	474,048,337	None
New Jersey & New York	46	36	July 1, 1938	1,022,960	2,228,600	3,251,560	None
New York, Susquehanna & Western	144	133	June 1, 1937	12,545,908	25,781,163	38,327,071	None
Wilkes-Barre & Eastern	....†	64	Sept. 25, 1937	2,665,000	3,000,000	5,665,000	None
Northern Railroad of New Jersey	....	21	Jan. 26, 1939	861,000	1,000,000	1,861,000	None
Nypano	....	424	July 1, 1938	28,000,000	20,000,000	48,000,000	None
Florida East Coast	685	679	Sept. 1, 1931	57,530,000	None	57,530,000	None
Fonda, Johnstown & Gloversville	20	20	Apr. 21, 1933	6,184,274	3,000,000	9,221,149	None
Fort Smith, Subiaco & Rock Island	15	15	July 23, 1938		nothing reported		
Georgia & Florida	408	363	Oct. 19, 1929	7,665,000	13,382,441	21,402,162	600,000
Georgia, Southwestern & Gulf	36	None	Jan. 2, 1933	76,800	14,700	147,650	None
Albany & Northern	....	35	Jan. 2, 1933	400,000	350,000	750,000	None
Louisiana Southern	15	15	Aug. 2, 1933	200,000	100,000	300,000	1,000
Meridian & Bigbee River	50	50	June 15, 1933	500,000	300,000	804,000	1,010,000
Minneapolis & St. Louis	1512	1417	July 26, 1923	44,306,613	25,792,600	70,099,213	None
Minneapolis, St. Paul & Sault Ste. Marie	3227	3183	Dec. 31, 1937	92,086,378	37,810,200	141,630,336	230,850
Missouri Pacific	7179	6294	Apr. 1, 1933	398,787,500	154,639,600	584,743,478	None
Boonville, St. Louis & Southern	....	0.18	June 1, 1936	250,000	None	250,000	None
Cairo & Thebes	....	25	Dec. 1, 1937	1,699,000	None	1,699,000	None
Chester & Mount Vernon	....	64	Dec. 1, 1937	None	None	None	None
Fort Smith Suburban	....	7	Dec. 1, 1937	None	None	None	None
Marion & Eastern	....	7	Dec. 1, 1937	None	None	None	None
Missouri-Illinois	193	133	July 1, 1933	3,211,500	1,102,500	4,314,000	None
Missouri Pacific R. R. Corp. in Neb.	....	349	Apr. 1, 1933	None	None	None	None
Natchez & Southern	7	7	Dec. 1, 1937	None	None	None	None
New Orleans, Texas & Mexico	191	173	July 1, 1933	42,970,000	14,832,900	57,802,900	None
Asherton & Gulf	32	32	Dec. 1, 1937	None	None	None	None
Asphalt Belt	18	18	Dec. 1, 1937	None	None	None	None
Beaumont, Sour Lake & Western	146	84	July 1, 1933	None	None	None	None
Houston North Shore	....	27	July 1, 1933	None	None	None	None
Houston & Brazos Valley	43	43	July 1, 1933	None	None	None	None
International Great Northern	1155	1101	Apr. 1, 1933	45,534,700	None	45,967,670	None
Austin Dam & Suburban	....	2‡	Dec. 1, 1937	None	None	None	None
New Iberia & Northern	104	65	Dec. 1, 1937	None	None	None	None
Iberia, St. Mary & Eastern	....	40	Dec. 1, 1937	None	None	None	None
Orange & Northwestern	62	62	Dec. 1, 1937	None	None	None	None
Rio Grande City	21	18	Dec. 1, 1937	None	None	None	None
St. Louis, Brownsville & Mexico	602	556	July 1, 1933	236,000	None	236,000	None
San Antonio Southern	45	29	Dec. 1, 1937	None	None	None	None
San Antonio, Uvalde & Gulf	317	314	July 1, 1933	None	None	None	None
San Benito & Rio Grande Valley	128	128	Dec. 1, 1937	None	None	None	None
Sugar Land	53	31	Dec. 1, 1937	None	None	None	None
Mobile & Ohio	1180	905	June 3, 1932	33,603,769	6,007,200	40,299,311	None
Nevada Copper Belt	30	41	Apr. 2, 1925	622,000	1,000,000	1,622,000	None
New York, New Haven & Hartford	1879	1211	Oct. 23, 1935	256,533,145	206,155,300	487,080,415	None
Hartford & Connecticut Western	....	25	July 30, 1936	None	338,200	338,200	None
Old Colony	....	455	June 3, 1936	14,348,000	25,077,000	40,825,000	None
Boston & Providence	....	65	Aug. 4, 1938	2,170,000	3,996,000	6,166,000	None
Providence, Warren & Bristol	....	14	Feb. 13, 1937	None	44,900	44,900	None
New York, Ontario & Western	576	318	May 20, 1937	30,202,049	58,114,043	89,373,092	None
Norfolk Southern	805	759	July 28, 1932	15,401,000	16,000,000	31,401,000	566,000
Oregon, Pacific & Eastern	20	20	Nov. 6, 1937	None	200,250	200,250	None
Pittsburg, Shawmut & Northern	190	156	Aug. 1, 1905	14,655,600	15,000,000	29,655,600	2,044,350
Rio Grande Southern	172	172	Dec. 16, 1929	4,509,000	4,510,000	9,019,000	31,000
Rutland	407	413	May 5, 1938	9,292,000	9,080,300	18,372,300	None
St. Louis-San Francisco	4824	4639	Nov. 1, 1932**	273,967,767	114,701,526	402,303,588	None
St. Louis Southwestern & Affiliated Companies	1690	1486	Dec. 12, 1935	52,281,180	37,079,700	113,136,373	None
Santa Fe, San Juan & Northern	....	32	Oct. 14, 1931	....	500,057	No other information available	
Seaboard Air Line	4315	3336	Dec. 23, 1930	159,712,095	85,110,662	244,822,757	23,263,900
Georgia, Florida & Alabama	....	192	Nov. 7, 1931	1,750,000	1,500,000	3,250,000	None
Seaboard-All Florida	....	184	Feb. 2, 1931	12,831,667	None	12,831,667	126,861
East and West Coast	side track		Feb. 2, 1931	583,333	None	583,333	15,420
Florida, Western & Northern	....	233	Feb. 2, 1931	13,585,000	None	13,585,000	166,719
Chesterfield & Lancaster	33	32	Apr. 14, 1931	186,000	None	186,000	None
Raleigh & Charleston	20	20	May 1, 1931	550,000	None	550,000	None
South Dayton	....	1	Jan. 12, 1937	No other information available			
Spokane International	148	139	Aug. 28, 1933	4,200,000	4,200,000	8,400,000	None
Coeur D'Alene & Pend D'Oreille	....	21	Aug. 30, 1933	544,000	None	544,000	None
Tallulah Falls	57	57	June 25, 1923	None	None	None	None
Virginia & Truckee	68	68	Apr. 27, 1938	None	5,000,000	5,000,000	2,000
Wabash	2409	1976	Dec. 1, 1931	128,811,026	138,120,767	266,931,793	21,070,994
Ann Arbor	294	294	Dec. 4, 1931	7,000,200	40,800	7,141,000	100,000
Waco, Beaumont, Trinity & Sabine	48	48	Feb. 8, 1930	390,000	1,113,000	1,503,000	12,734
Western Pacific	1208	1152	Aug. 2, 1935	51,665,100	75,800,000	138,008,988	10,000,000
Wichita Northwestern	99	99	Nov. 10, 1922	381,750	1,690,000	2,071,750	43,000
Wilmington, Brunswick & Southern	30	30	Mar. 17, 1933	93,750	165,000	258,750	None
Winchester & Wardensville	23	23	June 7, 1938	662,000	134,000	796,000	None
Wisconsin Central	1130	996	Dec. 2, 1932	43,759,000	27,392,200	71,151,200	3,250,669
Yosemite Valley	78	78	Dec. 22, 1936	2,318,000	2,000,000	4,342,761	None
Yreka Western	10	10	Sept. 16, 1935	None	None	508	16,000

* Yard tracks and sidings.
† Ceased operation March 26, 1939.
‡ Yard switching tracks.
** Changed to trusteeship October 1, 1933.
‡ Intercompany items excluded from some, but not all, of the totals shown.

as the year drew to a close. One large railroad went into bankruptcy during the year—the Central of New Jersey—being forced to take this step because of the excessive exactions in taxation by the state of New Jersey, which is even more notorious for the extreme limits to which it goes in squeezing taxes out of the railroads than it is for its easy liberality in levying fees on trucks, and for building heavy-duty highways usable by out-of-state trucks free of any charge whatsoever. The status of railroads in bankruptcy is given in detail in accompanying tables, and the trends of security prices are shown in charts—one covering 1939 by weeks and the other displaying these data by months back to 1923.

Equipment Issues

Equipment trust issues sold in 1939 totaling more than $93,000,000 in principal amount stand out as almost the one bright spot in the year's financial picture. Displaying more activity than there has been for a number of years, with the possible exception of 1937.

this field demonstrates to a marked degree how "cheap" money has become for the borrower who is able to offer air-tight security. And railway rolling stock, which does not become subordinate to outstanding railway obligations, provides the basis for this exceptionally favorable credit status.

The accompanying table of principal issues sold in 1939 shows that the roads enjoyed unprecedented bargains in borrowing for rolling stock purchase, two carriers selling their issues at record lows in interest cost of 1.6 and 1.62, respectively. Nor were the joys of a seller's market limited to the solvent roads; it is to be noted that one bankrupt carrier floated a large issue at a cost of but 2.2 through a New York securities firm. When such prices are compared with interest costs on equipment money upwards of 7 per cent paid by the most prosperous carriers back in the early 'Twenties, it is apparent that equipment trust issues are at present on sale in the bargain-basement of finance.

Of course the unusual security which the trusteeing of rolling stock affords to certificate holders has been the chief factor in equipment money costs since the very beginning of the so-called Philadelphia Plan in the last century. Its weight has been strengthened in the acid test of reorganization proceedings during the last few years, wherein, with but few exceptions, equipment issues have been kept intact. In the case of proceedings under Section 77 of the Bankruptcy Act, the integrity of such obligations is further guaranteed by paragraph (j) as amended in 1935 following the threat to 100 per cent treatment in the Rock Island proceedings.

But the current low interest rates are due more specifically to the keen competition for equipment trust obligations by institutional purchasers which find their special requirements well met by such characteristics as comparatively short lives, serial maturities and a minimum of price fluctuation. The fact is that during 1939 there were not enough issues "to go 'round," many of them being snatched up directly by institutional investors without further public offering. The year was remarkable, too, for the bids which came from numerous firms which do not ordinarily deal in this highly-specialized field, a fact which indicates how capital has piled up because there are so few places where responsible business men are willing to make capital investments.

The majority of 1939's issues carry a maturity cycle of ten years, while a few run for 15. The reason is obvious; the railroad gets a better price for a ten-year issue; the "wholesaler" finds a better retail market (experience teaches that "the last five years are the hardest" to sell of equipment trust certificates) and the final buyer maintains his desired short-term status.

Sixteen of the issues listed (approximately 60 per cent of total principal amount involved) were sold to investment firms or institutional holders while the remaining 15 were purchased by the Reconstruction Finance Corporation at par and accrued dividends. The latter, with one exception were negotiated under an R. F. C. equipment program announced at a special meeting of the Association of American Railroads on September 19 which provides that the Corporation purchase, subject to approval by the Interstate Commerce Commission, ten-year equipment trust certificates on the following interest bases: 3 per cent when the certificates cover the full delivered cost of the equipment; 2¾ per cent when a 10 per cent down payment is made; and 2½ per cent when a 20 per cent down payment is made. Previous to this, the R. F. C.'s most favorable rate had been 4 per cent where the trust covered the full cost and 3 per cent when it covered only 90 per cent of the cost.

Chairman Emil Schram of the R. F. C. reports that whereas the corporation concluded but a single equipment loan—for $640,000—in the first eight months of 1939, it issued conditional commitments (most of which are included in the accompanying list) aggregating $60,000,000 during September, October and November.

Equipment Prices

Issues of equipment trust certificates authorized by the Interstate Commerce Commission were more numerous during 1939 than any year of the depression except 1937. Since the Commission's finance reports issued in connection therewith comprise the only avaliable official

Principal Equipment Trust Issues Sold in 1939

Road	Maturity	Amount	Int. Rate %	Sold to Banker: Price	Sold to Banker: Cost	No. Bids Submitted	Purchaser
Atchison, Topeka & Santa Fe, Ser. C	1940-49	$8,000,000	2½	101.899	2.14	8	First Boston Corp., et al.
Bessemer & Lake Erie	1940-49	5,700,000	2½	104.696	1.6	10	Freeman & Co.
Chesapeake & Ohio	1940-49	4,200,000	2½	100.16	2.468	3	Halsey, Stuart & Co., et al.
Chicago & North Western	1940-49	1,800,000	2½	102.14	2.07	6	First Boston Corp.
Chicago, Milwaukee, St. Paul & Pacific, Ser. T	1940-49	1,920,000	3	100.5	2.92	3	Northwestern Mutual Life Insurance Co.
Chicago, Milwaukee, St. Paul & Pacific, Ser. U	1940-49	5,080,000	2½	Par	Par	..	Reconstruction Finance Corporation
Chicago, Rock Island & Pacific[1]	1940-49	2,680,000	2¾	Par	Par	..	Reconstruction Finance Corporation
Colorado & Southern[1]	1940-49	680,500	3	Par	Par	..	Reconstruction Finance Corporation
Denver & Rio Grande Western, Ser. E	1940-54	1,290,000	3	101.678	2.75	6	Bosworth, Chanute, Loughridge & Co., and Stone & Webster and Blodget
Elgin, Joliet & Eastern	1940-49	4,250,000	2½	104.625	1.62	6	Mellon Securities Corporation, et al.
Erie	1940-49	3,000,000	2½	Par	Par	..	Reconstruction Finance Corporation
Florida East Coast, Ser. I	1940-49	1,240,000	3	Par	Par	..	Reconstruction Finance Corporation
Ft. Worth & Denver City[1]	1940-49	619,500	3	Par	Par	..	Reconstruction Finance Corporation
Illinois Central, Ser. S	1940-54	7,800,000	3	Par	Par	..	Reconstruction Finance Corporation
Louisville & Nashville, Ser. H	1940-54	2,025,000	2¾	104.298	2.12	14	Harriman Ripley & Co.
Maine Central[2]	1940-49	1,230,000	3½	Par	Par	..	.....(3).....
Missouri-Illinois, Ser. AA	1940-49	590,000	2½	100.265	2.44	3	First National Bank of St. Louis
Missouri Pacific, Ser. CC	1940-49	2,980,000	2¼	100.139	2.22	6	Salomon Bros. & Hutzler et al.
New York Central	1940-49	9,000,000	2½	Par	Par	..	Reconstruction Finance Corporation
Norfolk Southern, Ser. B	1940-54	607,000	3	Par	Par	..	Reconstruction Finance Corporation
Northern Pacific[1]	1940-49	5,000,000	2¾	Par	Par	..	Reconstruction Finance Corporation
Pennsylvania, Ser. J	1940-54	8,865,000	2¾	99.118	2.87	5	Salomon Bros. & Hutzler et al.
Seaboard Air Line, Ser. II	1940-54	2,310,000	3	Par	Par	..	Reconstruction Finance Corporation
Seaboard Air Line, Ser. II	1940-54	2,250,000	3	Par	Par	..	Reconstruction Finance Corporation
Seaboard Air Line, Ser. HH	1940-49	640,000	3	Par	Par	..	Reconstruction Finance Corporation
Southern, Ser. DD	1940-49	400,000	2	100.079	1.985	5	Blyth & Co.
Southern Pacific, Ser. P	1940-54	7,575,000	2½	101.41	2.29	4	First Boston Corporation, et al.
Tennessee Central[1]	1940-49	185,000	2¾	Par	Par	..	Reconstruction Finance Corporation
Texas & Pacific, Ser. E	1941-55	1,335,000	3	Par	Par	..	Reconstruction Finance Corporation
Western Maryland, Ser. G	1940-49	2,300,000	2	101.531	1.70	7	Harriman Ripley & Co., et al.
Wheeling & Lake Erie, Ser. F	1940-49	1,200,000	2½	103.92	1.75	23	McMaster, Hutchinson & Co., et al.

[1] Not yet approved by I. C. C.
[2] Issued to cover unpaid balances on equipment purchased in 1936 under conditional sale contracts.
[3] Commitments for purchase received from 34 institutions.

Some of 1939's Freight Car Prices

No.	Type	Construction	Capacity Lb.	Unit Price
1800	Box	Steel	100,000	$3,293
300	Refrigerator	Steel	80,000	4,926
100	Refrigerator	Steel	100,000	5,616
50	Refrigerator (super-insul.)	Steel	100,000	6,454
200	Ballast	Steel	140,000	3,670
200	Gondola (H. Side)	Steel	100,000	3,165
50	Gondola (L. Side)	Steel	140,000	3,513
100	Flat	Steel	140,000	3,105
700	Hopper	Steel	100,000	2,226
650	Hopper	Steel	100,000	2,220
500	Hopper	Steel	100,000	2,212
150	Hopper	Steel	100,000	2,210
400	Gondola (L. Side)	Steel	100,000	2,475
100	Gondola (L. Side)	Steel	100,000	2,518
400	Box	Steel-Sheath	100,000	2,964
100	Auto-Box	Steel-Sheath	100,000	3,463
50	Gondola	Steel	140,000	3,843
1200	Hopper	Steel	100,000	2,265
400	Hopper	Steel	120,000	2,230
100	Hopper	Steel	120,000	2,236
200	Box (Lt. Weight)	Alloy-Steel (Weld.)	100,000	2,664
500	Box	Steel-Sheath	100,000	2,944
100	Gondola (H. Side)	Steel	100,000	2,897
250	Twin Hopper	Steel	100,000	2,346
250	Twin Hopper	Steel	100,000	2,370
10	Flat	Steel	100,000	3,306
1000	Box	Steel	100,000	2,600
1000	Auto-Box	Steel	100,000	2,625
500	Auto-Box	Steel	100,000	3,001
900	Gondola	Steel	100,000	2,318
100	Gondola	Steel	100,000	2,314
250	Box	Steel	100,000	2,707
50	Gondola	Steel	100,000	2,318
2000	Box	Steel	100,000	2,438
500	Box	Steel-Sheath	80,000	2,827
500	Box	Steel-Sheath	80,000	2,830
750	Hopper	Steel	100,000	2,648
750	Gondola	Steel	100,000	2,959
1000	Hopper	Steel	180,000	4,200
500	Gondola	Steel	100,000	3,300
500	Box	Composite	100,000	3,500
3500	Hopper	Steel	110,000	2,015
300	Auto-Box	Steel	110,000	3,690
200	Box	Steel	110,000	2,878
500	Box	Steel-Sheath	100,000	2,676
200	Box	Steel-Sheath	100,000	2,665
250	Gondola	Steel	140,000	3,083
300	Hopper	Steel	100,000	2,210
200	Hopper	Steel	100,000	2,293
50	Flat	Steel	140,000	2,432
500	Hopper	Steel	140,000	2,994
300	Box	Steel-Sheath	100,000	2,885
1000	Box	Steel	100,000	2,500
75	Caboose	Steel	.....	3,500
500	Gondola	Steel	100,000	2,650
600	Hopper (cent. dump)	Steel	100,000	2,808
300	Hopper (cent. dump)	Steel	100,000	2,807
300	Hopper (cent. dump)	Steel	100,000	2,811
300	Hopper (cent. dump)	Steel	100,000	2,801

source of information on equipment prices currently made public, this upswing in buying through equipment trusts places on record a larger sample of rolling-stock price quotations than has usually been available in the last decade. The price information is set forth the accompanying tables as taken from I. C. C. authorization reports. It should be noted that descriptions of equipment as they appear therein do not follow any standard of completeness, in some cases only the total purchase price being stated. To fill in the gaps, information from other sources was included in the tables, whenever available.

As found in the I. C. C. reports these prices cannot be properly considered as valid indices of equipment price trends. For one thing, only a fraction of new equipment purchased each year is financed through equipment trusts —fewer than one-third of the locomotives ordered in 1939 were purchased under equipment trust arrangements—and, in the case of freight cars, no information is available on the large number purchased by private car lines, whether through equipment trust issues or otherwise, inasmuch as these agencies are not required to report financing operations to the Commission. For another, the reports lack basic information on construction details which have a decided effect on price scales. They do not, for example, disclose whether a new box car is fitted with double side doors for l.c.l. service or with special automobile loaders, thus giving a distorted picture in unadorned price quotations.

This qualification is even more weighty in considering passenger car prices as they appear in the reports. Most of the equipment now being built is for "luxury" service, generally in small lots, and to new and special specifications. Further it generally carries expensive air-conditioning plants. To compare the bare prices of these units with each other or with those of the large-lot orders for "day-coaches" of the 'twenties, without further information, would obviously be highly fallacious.

Since all of the passenger equipment cited in the 1939 finance reports is priced as complete trains, without individual car details, no space is devoted to this category

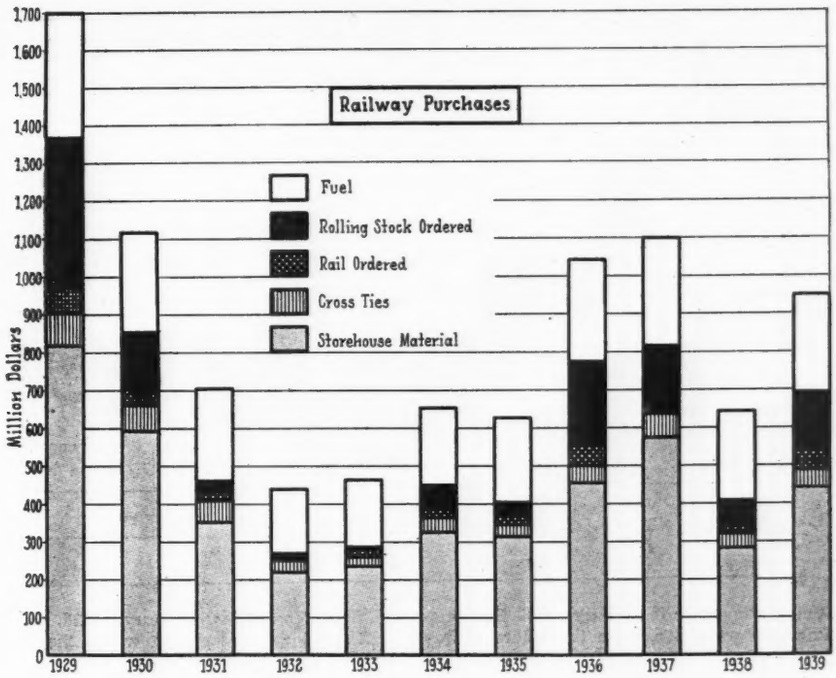
Partial List of 1939 Locomotive Prices

No.	Type	Service	Weight lb.	Tractive Force—lb. or hp.	Unit Price
2	Diesel-Elec.	Psgr.	308,000	2,000 hp.	$183,773
28	4-8-8-2	Mixed	657,900	124,300	183,375
12	2-8-8-4	Frt.	689,900	124,300	200,012
1	Diesel-Elec.	Psgr.	308,495	2,000 hp.	164,250
6	Diesel-Elec.	Psgr.	308,495	2,000 hp.	182,500
1	Diesel-Elec. (cabless)	Psgr.	298,960	2,000 hp.	155,250
1	Diesel-Elec. (cabless)	Psgr.	298,960	2,000 hp.	172,500
1	Diesel-Elec.	Psgr.	308,495	2,000 hp.	185,000
20	Electric	Psgr.	460,000	4,620 hp.	255,000
5	2-8-4	Frt.	330,000	71,500 hp.	135,000(av.)
2	Diesel-Elec.	Psgr.	300,000	2,000 hp.	178,825
1	Diesel-Elec.	Sw.	250,000	1,000 hp.	84,881
1	Diesel-Elec.	Sw.	240,000	1,000 hp.	79,950
1	Diesel-Elec.	Sw.	230,000	1,000 hp.	84,882
2	Diesel-Elec.	Sw.	192,000	900 hp.	97,850
2	Diesel-Elec.	Sw.	200,000	600 hp.	62,744
10	4-8-4	Frt.	.....	.....	147,500
7	Diesel-Elec.	Sw.	191,000	600 hp.	62,540
1	Diesel-Elec.	Sw.	243,000	1,000 hp.	84,662
2	Diesel-Elec.	Tr.	486,000	2,000 hp.	170,724
5	Diesel-Elec.	Sw.	220,000	600 hp.	63,000
8	Diesel-Elec.	Sw.	198,000	600 hp.	62,250

of rolling stock in the accompanying tables. In lieu of this, the following purchases may be noted textually: 28 cars (including 2 chair-baggage, 2 diners, 2 kitchen, 2 coffee-shop, 2 parlor-observation, 4 chair, 2 parlor and 2 tavern) of which 8 are articulated in pairs, priced at an *average* of $72,080 per car; 2 seven-car stainless steel trains at an estimated unit price (per train) of $503,476; 2 six-car streamlined trains at an estimated unit price of $364,027; 2 observation-coaches, 5 coaches, 2 dormitory-baggage, 2 dining, 1 lounge-diner and 2 tavern cars at a *total* price of $1,000,796; a streamlined train (1 baggage-dormitory, 1 diner, 1 tavern-coach, 1 observation-coach and 3 coaches) at a *total* price of $525,000.

* * *

Tie Plates from a Relaying Program Waiting to be Sorted by Store Forces



Materials and Equipment Purchased Annually by Class I Railroads 1929 to 1939, Inclusive

A Billion Dollars of Railway Buying in 1939

Purchasing from manufacturers up 67 per cent—Inventories up slightly—Deferred buying still large

By D. A. Steel

Purchases and Stores Editor

FIGURES available at this time indicate that the purchases made in the United States last year by the steam railroads amounted in round numbers to a billion dollars. This includes unfilled orders for material and equipment for the Class I railroads of the United States and about $20,000,000 of materials, fuel and equipment estimated to have been purchased by the switching and terminal companies and short lines of the United States and about $25,000,000 of materials, fuel and equipment obtained in this country by railroads of Canada and Mexico. It excludes, however, the considerable expenditures made by the railroads of the United States with commercial concerns for heat, light, water, rent and miscellaneous services, and it also excludes the materials furnished by contractors of railway construction projects.

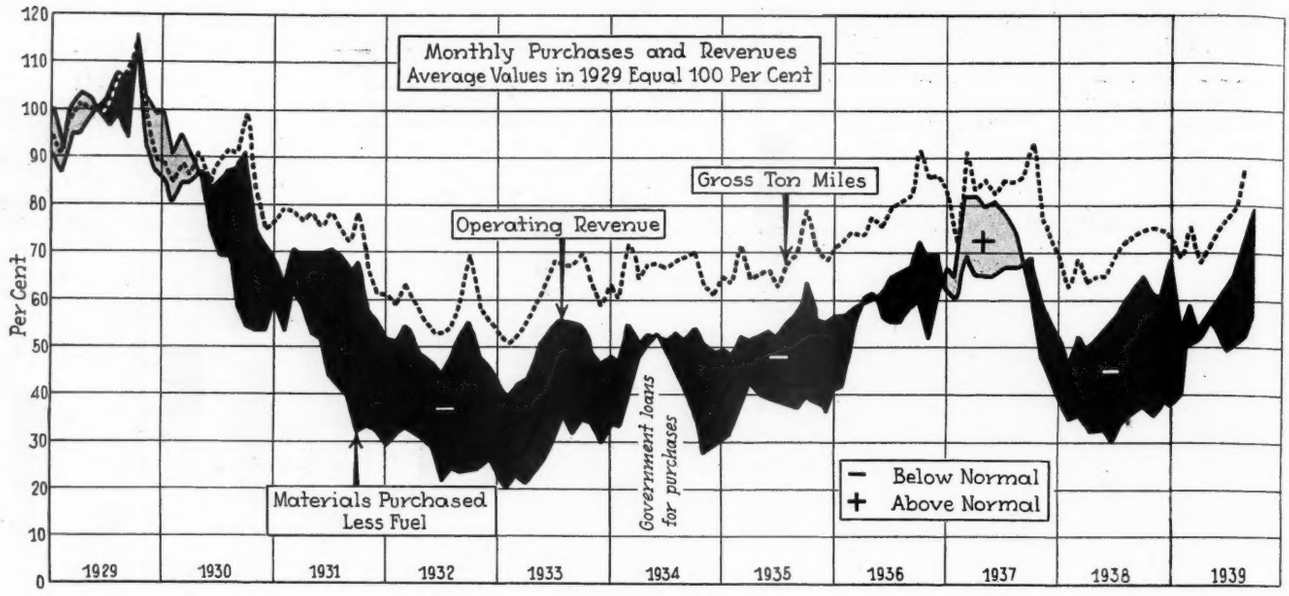
In assembling statistics on railway buying, this paper has again combined the materials received by the railroads, as reported month to month *to* this paper, with the expenditures for new cars and locomotives ordered from commercial builders of equipment, as reported from week to week *in* these columns. Materials for equipment to be built in railway shops are normally assumed to be included under materials received.

Last fall the railroads were caught in the war hysteria which swept the country when war broke out in Europe and, fearful of increasing prices, they bought so much more material than could be delivered before the year closed that figures compiled as outlined understate the full value of buying last year to the extent that the orders carried over from 1939 exceed the usual carry over. Last year, for example, the railroads ordered at least

Railway Purchases—Supplies and Equipment—Twelve Months Class I Roads

	Materials received from mfrs. (000)	Equipment ordered from mfrs. (000)	Total from mfrs. (000)	Fuel* (000)	Total including fuel (000)
1929	$991,795	$397,121	$1,388,916	$336,805	$1,725,721
1930	727,223	146,471	873,694	308,277	1,181,971
1931	451,651	28,873	480,524	243,349	723,873
1932	268,100	2,623	270,723	177,000	447,723
1933	276,846	5,857	282,703	180,904	463,607
1934	395,012	66,850	461,862	209,488	671,350
1935	365,830	35,696	401,526	228,720	630,246
1936	555,841	222,594	778,435	266,463	1,044,898
1937	697,402	173,320	870,722	282,366	1,153,088
1938 ...	343,033	74,006	417,039	239,778	656,817
1939	523,495	160,000	683,495	258,884	942,379

Subject to revision.
* Coal and fuel oil.

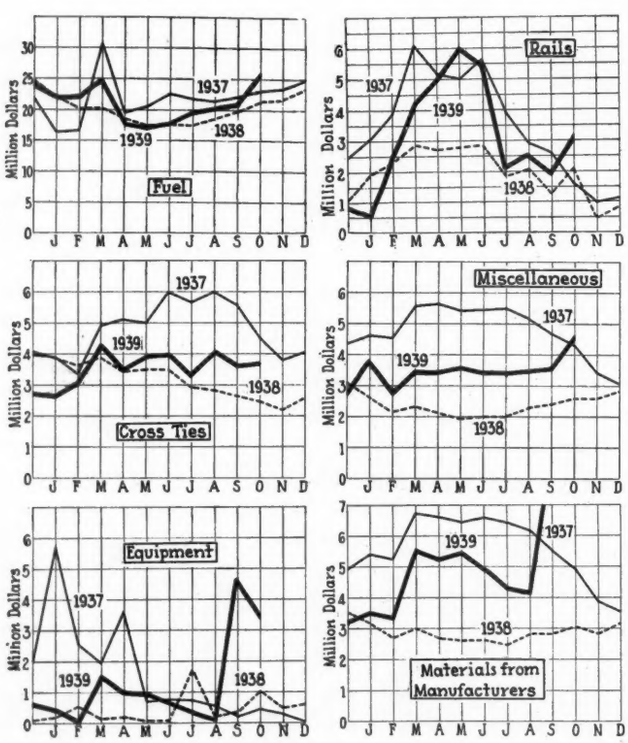


Comparative Trends of Purchases, Revenues and Gross Ton Miles, January, 1929, to November, 1939. Black Areas Indicate where Railroads were Behind in their Rate of Buying. Shaded Areas Indicate where they were Catching Up. Purchases Exclude Fuel and Rolling Stock

$15,000,000 more rail and $10,000,000 more material for new locomotives and cars to be built in railroad shops than they received in 1939. The statistics also exclude materials purchased for short lines.

As compiled, however, the purchases of the Class I railroads, exclusive of short lines and the Canadian and Mexican roads, amounted to approximately $942,379,000 in 1939, consisting of $523,495,000 of materials, exclusive of fuel, *received* from manufacturers and $160,000,000 of equipment *ordered* from manufacturers, or a total of $683,495,000 of materials and equipment from manufacturers, while the remaining $258,884,000 was for fuel. The inclusion of undelivered rail and materials for building equipment in company shops would probably increase the purchases of materials from manufacturers last year to $538,495,000 and the purchases of material *and* equipment, exclusive of fuel, from manufacturers to $698,495,000 and the total purchases of materials, fuel and equipment of the Class I railroads to $957,379,000. This was an increase of $195,462,000, or 57 per cent, in the purchases made by the Class I railroads for materials, exclusive of fuel and equipment, from manufacturers over the corresponding purchases in 1938; it was an increase of $85,994,000, or 115 per cent, in the purchases of new equipment ordered from manufacturers and an increase of $281,456,000, or 67 per cent, in the purchase of materials *and* equipment, exclusive of fuel, from manufacturers.

Materials, exclusive of equipment and fuel, purchased from manufacturers in 1939 (as adjusted to include

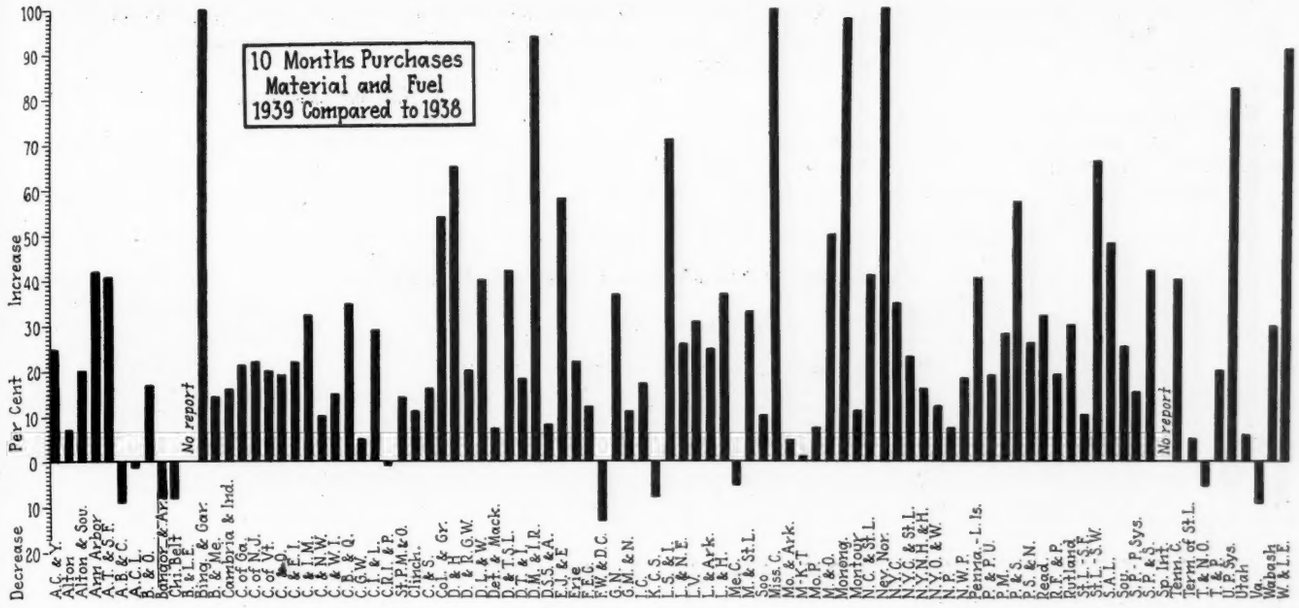


Month to Month Trends in the Dollar Volume of Fuel, Crossties, Rail and Miscellaneous Materials Received By Class I Railroads and Locomotives and Cars Ordered From Builders of Equipment

Railway Purchases—Materials and Supplies

	Fuel (000)	Rail (000)	Cross Ties (000)	Other Material (000)	Total (000)	Total Less Fuel (000)
			Year 1938			
January	$22,198	$1,830	$3,867	$26,225	$54,120	$31,922
February	20,298	2,369	3,698	21,521	47,886	27,588
March	20,334	2,886	3,891	23,563	50,674	30,340
April	18,770	2,749	3,464	21,227	46,210	27,440
May	17,452	2,794	3,525	19,864	43,635	26,183
June	17,825	2,845	3,537	20,001	44,208	26,383
July	17,535	1,787	2,929	20,112	42,363	24,828
August	18,739	2,069	2,827	23,340	46,975	28,236
September	19,828	1,226	2,745	24,724	48,523	28,695
October	21,522	2,075	2,508	26,186	52,291	30,769
November	21,827	407	2,228	26,154	50,616	28,789
December	23,450	883	2,692	28,285	55,310	31,860
12 Mos.	$239,778	$23,920	$37,911	$281,202	$582,811	$343,033
			Year 1939			
January	$23,102	$445	$2,601	$27,311	$53,459	$30,357
February	22,792	2,706	2,799	26,825	55,122	32,330
March	24,075	4,271	3,893	33,609	65,848	41,773
April	17,624	4,953	3,507	34,010	60,094	42,470
May	16,727	6,058	3,932	35,868	62,585	45,858
June	17,574	5,435	3,981	34,132	61,122	43,548
July	19,273	2,114	3,358	33,715	58,460	39,187
August	20,206	2,546	4,020	34,701	61,473	41,267
September	21,042	1,844	3,571	35,347	61,804	40,762
October	26,469	3,045	3,666	45,232	78,412	51,943
November*	25,000	7,500	4,500	45,000	82,000	57,000
December*	25,000	7,500	4,500	45,000	82,000	57,000
12 Mos.	$258,884	$48,417	$44,328	$430,750	$782,379	$523,495

* Subject to revision.



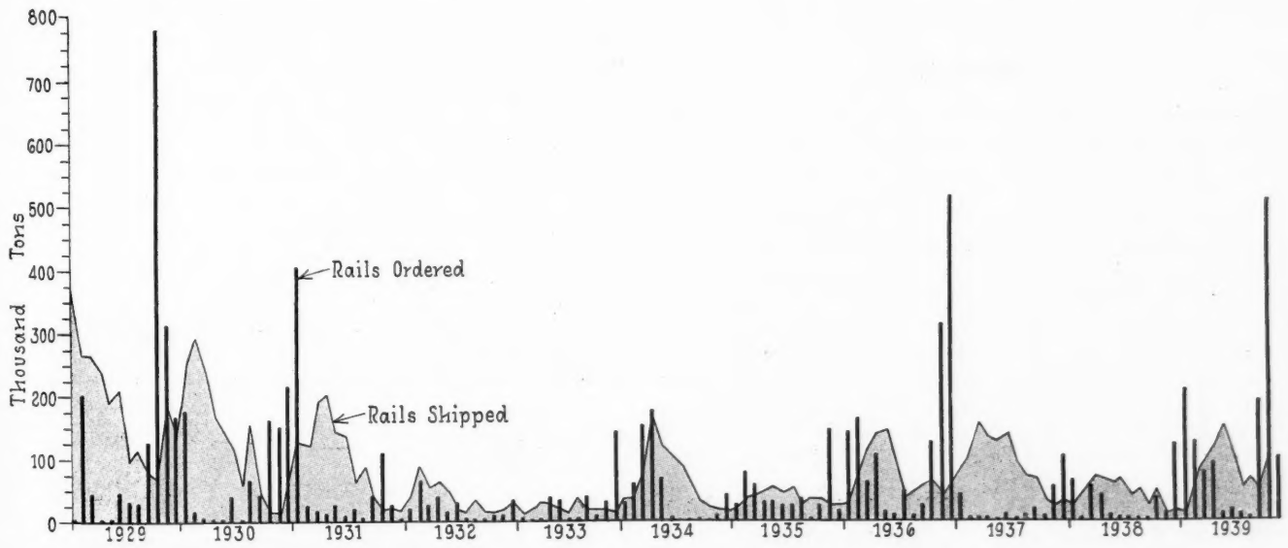
The Percentage Increase or Decrease of Material and Fuel Purchased By Individual Railroads During the 10 Months of 1939 As Compared with 10 Months of 1938

undelivered material) were approximately equal to the purchases in 1936 but were about 23 per cent under the corresponding purchases in 1937, before making adjustments for changes in material costs. Orders for new equipment from builders were $62,594,000 under the corresponding purchases in 1936 but were only about $13,320,000 less than the corresponding purchases in 1937. The combined purchases of materials *and* equipment, exclusive of fuel, from manufacturers in 1939 (adjusted to include undelivered materials) were approximately $79,940,000 below the corresponding purchases in 1936 and were less by approximately $172,227,000, or 19 per cent, than the corresponding purchases in 1937.

In connection with track improvement programs, the calendar year is not as accurate a barometer of roadway activities, as measured by the purchases of rail, as the period from September 1 to September 1, since a large amount of rail is usually ordered during the last three months of the calendar year for the relaying programs of the following calendar year. However, because of the quick upturn in steel orders last fall, the proportion of the total year's requirements that were ordered in the fall was increased materially last year, with the result that the rails known to have been ordered in 1939, including those ordered in the early months of the year for relaying during that year and those ordered during the closing months of the year for 1940 use, totaled 1,329,000 tons, a tonnage larger than was ordered in any calendar year since 1929, with the exception of 1936 when the orders totaled 1,557,000 tons. The railroads ordered about 2,049,000 tons in 1929, 849,000 tons in 1930, 678,000 tons in 1931, 217,900 tons in 1932, 332,000 tons in 1933, 524,000 tons in 1934, 265,000 tons in 1935, and 369,000 tons in 1938.

Fuel purchases by the Class I railroads last year showed an increase of approximately $18,106,000, or 8 per cent, over 1938 and a decline of approximately $23,482,000, or 17 per cent, from 1937.

Crosstie purchases last year, amounting to $44,328,000, including $15,000,000 of ties on which the railroads probably took delivery in November and December, were larger by approximately $6,417,000, or 17 per cent, than



Rails Ordered and Shipped Month to Month January, 1929, to November, 1939

in 1938, although approximately $9,272,000, or 17 per cent, under 1937. During the last four months the railroads increased their purchases of ties for delivery in 1940.

Miscellaneous purchases received by the Class I railroads in 1939, amounting to $430,750,000, not counting undelivered rail and undelivered materials for equipment to be built in company shops, showed an increase of totalling $51,943,000, compare with $32,330,000 in February, 1939, and $30,357,000 in January.

Gains General

Most of the railroads in the United States bought more heavily in 1939 than in 1938. Materials and fuel, exclusive of equipment, received in the first 10 months

Purchases of Material and Fuel—10 Months

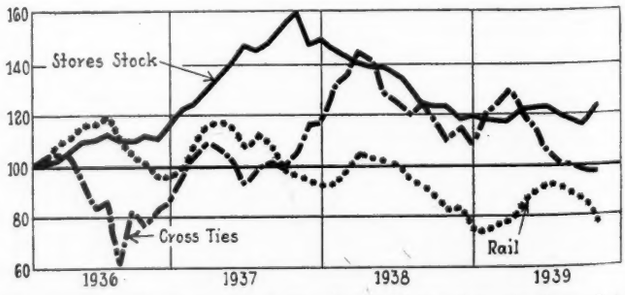
Road	1939	Per Cent of Operating Revenues	1938	Per Cent Increase
A. C. & Y.	$ 273,142	16.3	$ 218,151	25
Alton	2,602,088	18.9	2,423,612	7
Alton & Sou.	231,762	...	192,791	20
Ann Arbor	749,482	23.0	526,782	42
A. T. & S. F.	30,474,454	23.0	21,699,052	41
A. B. & C.	585,007	20.0	629,108	-9
A. C. L.	8,518,306	21.8	9,080,681	0
B. & O.	20,548,027	15.6	12,244,800	165
Bang. & Aroos.	915,986	21.1	1,272,914	-28
Belt Ry. of Chi.	741,242	...	805,313	-8
Bing. & Gar.	256,241	...	87,093	296
Bost. & Me.	6,133,400	16.0	4,479,479	14
Cambria & Ind.	127,305	11.1	109,806	16
Cent. of Ga.	2,819,337	21.9	2,306,733	21
Cent. of N. J.	5,190,334	18.7	4,224,543	22
Cent. of Vt.	1,116,536	23.8	966,681	20
Char. & W. C.	487,621	21.4	500,836	0
C. & O.	14,236,073	14.7	11,969,165	19
C. & E. I.	2,190,878	17.3	1,791,361	22
C. & I. M.	563,287	18.1	427,714	32
C. & N. W.	13,150,216	18.1	11,954,334	10
C. & W. I.	533,059	...	465,709	15
C. B. & Q.	16,153,951	20.4	11,944,253	35
C. G. W.	3,234,830	21.4	3,081,207	5
C. I. & L.	1,073,067	14.5	852,846	21
C. R. I. & P.	14,906,156	21.5	15,056,675	-1
C. St. P. M. & O.	3,464,469	18.9	3,058,788	14
Clinch	993,810*	17.0	893,892	11
Colo. & Sou.	1,171,868	21.8	1,016,982	15
Col. & Gr.	282,991	23.6	181,052	54
D. & H.	3,518,010	16.8	2,136,357	65
D. & R. G. W.	4,465,024	21.8	3,706,872	20
D. L. & W.	6,343,393	13.0	4,507,838	40
Det. & Mack.	136,376	19.4	126,686	7
D. & T. S. L.	284,430	10.8	199,282	42
D. T. & I.	580,548	10.8	491,721	18
D. M. & I. R.	2,076,129	12.8	1,068,001	94
D. S. S. & A.	333,497	17.0	361,015	8
E. J. & E.	1,663,687	11.9	1,054,429	58
Erie	12,092,835	18.3	9,803,043	22
F. E. C.	1,505,303	19.7	1,340,407	12
Ft. W. & D. C.	1,105,587	21.9	1,279,985	-13
Gt. Nor.	16,518,056	21.2	12,003,568	37
G. M. & N.	864,954	15.2	790,887	11
I. C.	18,230,352	20.0	15,460,971	17
Ill. Term.	852,270	17.5	.....	..
K. C. Sou.	1,424,107	13.0	1,548,571	-2
K. C. Term.	642,278	...	622,723	3
L. S. & I.	201,655	8.1	118,657	71
L. & N. E.	456,997	12.7	360,569	26
Lehigh Val.	7,009,684	18.7	5,337,202	31
La. & Ark.	1,193,416	19.2	948,556	26
L. & N.	13,006,078	18.0	9,466,362	37
Me. Cent.	1,980,649	19.2	2,011,982	-5
M. & St. L.	1,685,870	22.0	1,259,472	33
Soo	4,381,448	18.5	4,199,207	10
Miss. Cent.	152,142	21.2	85,042	178
Mo. & Ark.	178,952	19.8	173,395	3
M-K-T	3,254,835	13.7	3,266,081*	1
Mo. Pac.	20,273,541	22.6	18,545,999	12
M. & O.	1,974,012	20.0	1,404,365	40
Monong	343,799	10.5	183,383	87
Montour	239,870	14.8	215,389	11
N. C. & St. L.	2,573,201	20.8	1,820,258	41
Nev. Nor.	170,285	31.8	83,209	104
N. Y. C. Sys.	53,884,222	18.3	39,784,999	35
N. Y. C. & St. L.	6,035,284	17.1	4,900,853	23
N. Y. N. H. & H.	10,904,695	15.9	9,357,234	16
N. Y. O. & W.	1,167,164	22.4	1,041,699	12
Nor. Pac.	11,523,570	21.5	10,931,209	6
Northwest Pac.	375,350	13.4	455,713	-18
Penna.-Long Is.	49,878,196	13.5	13,810,841	40
P.-R. S. S.	848,342	17.0	360,165	130
P. & P. U.	285,964	13.4	240,217	19
Pere Mar.	5,438,209	22.1	4,260,940	28
Pitt. & Shaw	135,041	25.2	85,470	58
Pitt. & W. Va.	266,840*	9.3	412,549*	-35
P. S. & Nor.	118,462	14.6	93,038	26
Reading	7,166,733	15.5	5,444,018	32
R. F. & P.	1,685,110	23.8	1,402,240	19
Rutland	697,275	24.2	534,826	30
St. L.-S. F.	8,477,928	21.6	8,050,003	5
St. L.-S. W.	4,160,154	25.8	2,252,366	66
S. A. L.	9,807,151	27.2	6,684,441	48
Sou.	20,651,001	19.3	15,975,774	30
S. P.-Pac. Sys.	26,507,442	19.2	23,092,089	15
S. P. & S.	1,616,199	22.4	1,135,439	42
Tenn. Cent.	399,938	19.8	284,703	40
Term. of St. L.	1,270,416	...	1,207,209	5
T. & N. O.	5,143,843	14.4	5,407,650	-5
Tex. & Pac.	4,157,496	19.1	3,471,865	20
U. P. Sys.	37,318,241	27.4	20,567,818	82
Utah	69,012	11.1	65,227	6
Va.	2,547,585	14.6	2,817,611	-9
Wabash	6,864,339	18.9	5,246,673	30
West. Md.	3,185,018	24.6	1,776,378	80
West. Pac.	2,714,000	19.6	4,398,400	-38
W. & L. E.	1,769,368	14.7	925,219	91

* October estimated.

approximately $149,542,000, or 53 per cent, over the corresponding purchases in 1938 and a decline of approximately $145,320,000, or 25 per cent, from the purchases in 1937.

Trends Up

Not only were the aggregate purchases made in 1939 larger than in 1938 but the trend was upward all year. The railroads ordered 80 per cent of their freight cars last year in the months of September, October and November and their purchases of equipment in those months exceeded the corresponding purchases made even in the last four months of 1929. The 800,000 tons of rail known to have been ordered since last September was 60 per cent of the tonnage known to have been ordered during the entire year. The railroads took delivery on $3,666,000 of crossties in October, as compared with $2,600,000 in January and $2,800,000 in February, 1939, and are believed to have received $9,000,000 of ties in November and December. Miscellaneous materials received in October, amounting to $45,232,000, compare with $35,347,000 in September, $26,825,000 in February, and $27,311,000 in January. Materials, exclusive of fuel, received from manufacturers in October, of 1939 showed increases of 42 per cent on the Ann Arbor, 41 per cent on the Santa Fe, 165 per cent on the Baltimore & Ohio, 22 per cent on the Central of New Jersey and the Chicago & Eastern Illinois, 19 per cent on the Chesapeake & Ohio, 35 per cent on the Burlington, 65 per cent on the Delaware & Hudson, 40 per cent on the Delaware, Lackawanna & Western, 58 per cent on the Elgin, Joliet & Eastern, 37 per cent on the Great Northern and Louisville & Nashville, 178 per cent on the Mississippi Central, 40 per cent on the



Comparative Month to Month Trends of Material in Stock to Oct. 31, 1939. Values on Jan. 1936 equal 100. Note Declines in Rail, Cross Ties and Store Stocks

Mobile & Ohio, 31 per cent on the Lehigh Valley, 35 per cent on the New York Central, 48 per cent on the Pere Marquette, 40 per cent on the Pennsylvania, 32 per cent on the Reading, 66 per cent on the St. Louis Southwestern, 48 per cent on the Seaboard Air Line, 30 per cent on the Southern, 42 per cent on the Spokane, Portland & Seattle, 82 per cent on the Union Pacific, and 80 per cent on the Western Maryland.

Materials in Stock—Class I Railroads

	Fuel (000)	Rail New and S. H. (000)	Crossties (000)	Stores Stock (000)	Scrap (000)	Total (000)
			Year 1938			
Jan. 1	$30,499	$30,333	$59,015	$252,104	$13,106	$385,057
Feb. 1	31,453	31,820	66,153	242,328	11,634	383,388
Mar. 1	28,822	32,238	68,558	240,790	11,642	382,050
Apr. 1	27,847	34,644	73,280	233,396	11,214	380,381
May 1	25,223	34,076	71,583	232,747	10,464	374,093
June 1	22,391	33,504	65,020	230,902	12,127	363,944
July 1	22,568	33,007	63,271	226,370	10,042	355,258
Aug. 1	20,665	32,238	60,900	219,735	11,855	345,393
Sept. 1	23,192	30,451	62,935	210,564	10,369	337,511
Oct. 1	23,376	28,934	58,968	207,791	10,818	329,887
Nov. 1	20,802	27,280	55,619	207,814	11,282	322,797
Dec. 1	24,311	27,544	60,750	194,137	11,882	318,624
			Year 1939			
Jan. 1	$22,660	$24,733	$59,491	$199,477	$11,200	$317,561
Feb. 1	25,594	24,691	61,796	196,330	10,393	318,804
Mar. 1	27,100	26,299	63,346	196,669	10,239	323,583
Apr. 1	29,445	27,695	65,246	197,383	10,686	330,455
May 1	24,101	28,459	60,749	203,806	11,217	328,332
June 1	21,048	29,345	57,067	205,169	11,548	324,177
July 1	18,732	30,520	52,809	205,027	11,761	318,849
Aug. 1	20,175	30,026	52,158	197,960	12,023	313,342
Sept. 1	21,165	29,137	51,375	194,802	12,384	308,863
Oct. 1	21,512	28,274	49,592	193,025	12,235	304,638
Nov. 1* ...	21,242	26,838	48,188	204,638	12,035	312,941

* Subject to revision.

Inventories

On November 1, 1939, materials and supplies in the hands of the Class I railroads totaled $312,941,000. In this total was approximately $21,242,000 of fuel, $26,838,000 of new and second rail, including rail on rests, $48,188,000 of crossties, $204,638,000 of storehouse and miscellaneous materials and approximately $12,035,000 of unsold scrap. The aggregate inventory on November 1 was approximately $17,514,000, or 5 per cent, less than the total on April 1, when inventories were highest in 1939 and they were less by approximately the same amount than on November 1, 1938; they showed a decline of approximately $70,853,000, or 18 per cent, from the inventory on October 1, 1937, when inventories were at their peak after the pile-up of materials following the recession of business in 1937.

The inventory of rail on November 1, 1939, totaled about the same as on November 1, 1938, a decline of approximately $11,973,000, or 30 per cent, from July 1, 1936, when rail stocks were highest in the past four years. Crossties on hand November 1 showed a decline of approximately $17,058,000 or 26 per cent from April 1, 1939, when crosstie stocks were highest last year; they showed a decline of approximately $17,431,000, or

(*Continued on page 88*)

Materials in Stock Oct. 31, 1939

Road	Rail—New and S. H. Oct. 31, 1939	Rail—New and S. H. Per Mile	Crossties Oct. 31, 1939	Crossties Per Mile	Other Material Less Fuel Oct. 31, 1939	Other Material Less Fuel Decrease Per Cent
Alton	$55,915	$57	$71,033	$74	$447,079	+ 1
Alton & Sou.	6,327	..	1,743	..	46,976	1
Ann Arbor	10,913	37	9,719	33	167,221	1
A. T. & S. F.	2,352,012	174	6,555,652	480	9,268,017	10
A. B. & C.	11,111	..	43,318	..	205,833	+ 1
A. C. L.	447,280	88	344,786	68	1,879,256	3
B. & O.	317,926	50	506,332	80	5,138,847	17
Bang. & Aroos.	61,103	100	120,479	200	592,083	+ 3
Belt of Chi.	67,545	..	99,120	..	210,406	..
Bing. & Gar.	7,197	..	21,232	..	19,467	53
Bost. & Me.	284,768	145	595,448	310	1,960,392	..
Burl.—R. I.	3,593	14	38,734	150	35,218	..
Cambria & Ind.	12,453	340	14,252	390	37,266	1
C. of Ga.	120,367	65	238,758	121	562,736	13
C. of N. J.	97,321	136	106,608	150	1,044,732	+ 6
C. of Vt.	73,106	171	124,820	290	268,782	24
Char. & W. C.	9,728	28	44,176	129	107,486	19
C. & O.	.....	..	.....	..	3,584,788#	13
C. & E. I.	188,169	200	121,532	132	496,222	2
C. & I. M.	50,455	385	23,009	175	228,499	26
C. & N. W.	1,086,405	128	2,390,654	285	4,937,683	10
C. & W. I.	59,773	..	37,193	..	222,001	..
C. B. & Q.	856,694	96	2,634,363	290	4,181,919	..
C. G. W.	6,835	5	28,597	19	432,417	+ 1
C. I. & L.	88,882	162	92,300	169	446,167	26
C. R. I. & P.	1,183,082	150	1,153,243	148	4,878,040	5
C. St. P. M. & O.	205,115	126	283,689	174	765,093	5
Clinchfield	8,214	26	94,455	308	266,446	2
Colo. & Sou.	60,549*	76	50,730	64	308,914	+46
Col. & Gr.	18,960	111	3,382	200	122,965	+ 6
D. & H.	148,315	177	356,732	425	1,414,554	2
D. & R. G. W.	381,227*	149	213,271*	83	2,527,296	1
D. L. & W.	154,839	157	231,143	235	1,150,224	7
Det. & Mack.	21,267	88	9,525	40	137,387	1
D. & T. S. L.	9,467	190	10,591	210	72,715	+ 2
D. T. & I.	34,852	74	74,289	157	246,956	17
D. M. & I. R.	88,129	163	347,311	640	543,074	+ 1
D. S. S. & A.	6,614	12	18,534	34	146,511	+ 7
E. J. & E.	62,717	160	38,782	99	770,166	+ 5
Erie	266,846	116	748,644	330	2,008,535	+13
F. E. C.	302,280	440	74,397	108	1,146,826	5
Ft. W. & D. C.	30,775	34	21,023	23	361,134	9
G. N.	1,124,135	140	733,929	91	5,644,729	+14
G. M. & N.	48,993	59	51,434	62	380,460	..
I. C.	31,973	5	427,881	65	4,391,819	24
Ill. Term.	16,425	35	72,650	150	288,302	..
K. C. S.	60,738	69	244,132	278	399,688	34
K. C. Term.	1,386	..	18,686	..	124,699	1
L. S. & I.	46,880	300	17,693	113	156,568	+25
L. & H. R.	22,454	225	7,926	79	56,177	..
L. & N. E.	60,579	310	32,715	167	205,357	+26
Leh. Val.	119,755	93	121,347	95	1,844,472	+ 5
La. & Ark.	76,983	90	82,187	97	513,746	+23
L. & N.	324,655	66	2,029,119	415	4,310,587	3
Me. Cent.	118,095	120	114,519	115	802,661	3
M. & St. L.	94,553	62	184,490	120	493,234	+ 1
Soo	166,153	39	190,626	45	1,187,711	3
Miss. Cent.	14,671	98	34,097	290	40,859	..
Mo. & Ark.	2,584	7	1,936	5	52,502	+21
M-K-T	54,975	17	293,568	90	1,460,413	6
M. & O.	59,344	50	244,914	21	791,200	+ 7
Monong	14,706	86	11,160	65	169,574	+ 1
Montour	18,091	330	1,121	20	148,874	+15
N. C. & St. L.	105,130	95	377,343	340	1,007,278	4
Nev. Nor.	13,582	82	16,969	102	66,284	2
N. Y. C. Sys.	1,920,341	170	3,623,850	320	22,035,402	2
N. Y. C. & St. L.	.....	..	.....	..	1,511,800#	12
N. Y. N. H. & H.	531,420	268	794,942	420	3,093,127	8
N. Y. O. & W.	34,493	60	3,925	7	398,692	+ 6
N. & W.	730,319*	330	833,040*	380	4,909,061*	+ 1
N. P.	356,094	53	1,419,736	210	5,731,284	11
N. W. P.	49,718	140	52,206	148	74,926	12
Penna.-L. I.	2,465,985	230	3,630,537	340	24,259,054	5
Pa.-R. S. S.	19,407	47	18,669	45	83,684	+15
P. & P. U.	17,322	..	2,199	..	90,871	+21
Pere Mar.	.....	..	.....	..	1,879,406#	+18
Pitt. & Shaw.	5,195	51	14,211	142	72,053	10
P. S. & Nor.	10,698	56	8,741	46	51,279	9
Reading	427,098	290	489,025	340	2,895,398	20
R. F. & P.	.....	..	.....	..	695,995	1
Rutland	33,968	83	28,334	70	183,302	1
St. L.-S. F.	317,512	62	1,061,428	210	2,722,128	11
St. L. S. W.	252,349	150	210,759	124	1,014,338	+26
S. A. L.	391,514	90	378,833	87	2,975,950	+ 6
Sou.	371,140	49	1,298,095	179	4,786,421	+20
S. P.-Pac. Sys.	952,953	111	899,430	108	6,144,096	+ 2
S. P. & S.	85,321	90	60,761	65	549,150	+ 7
Tenn. Cent.	.....	..	4,831	..	169,010	26
Term. of St. L.	12,166	..	13,687	..	281,171	17
T. & N. O.	521,164	118	410,103	93	1,963,188	1
Tex. & Pac.	290,397	150	216,727	111	2,255,034	+ 1
U. P. Sys.	2,049,070	206	2,770,342	280	14,973,528	7
Utah	36,826	330	49,917	450	163,916	+ 4
Va.	280,655	440	423,584	660	1,439,931	..
Wabash	234,243	97	381,737	158	1,365,701	5
West. Md.	7,303	85	401,777	470	958,789	10
West. Pac.	217,200	180	288,400	238	1,471,200	22
W. & L. E.	217,344	430	84,563	166	721,555	4
W. F. & Sou.	697	..	2,683	..	21,054	..

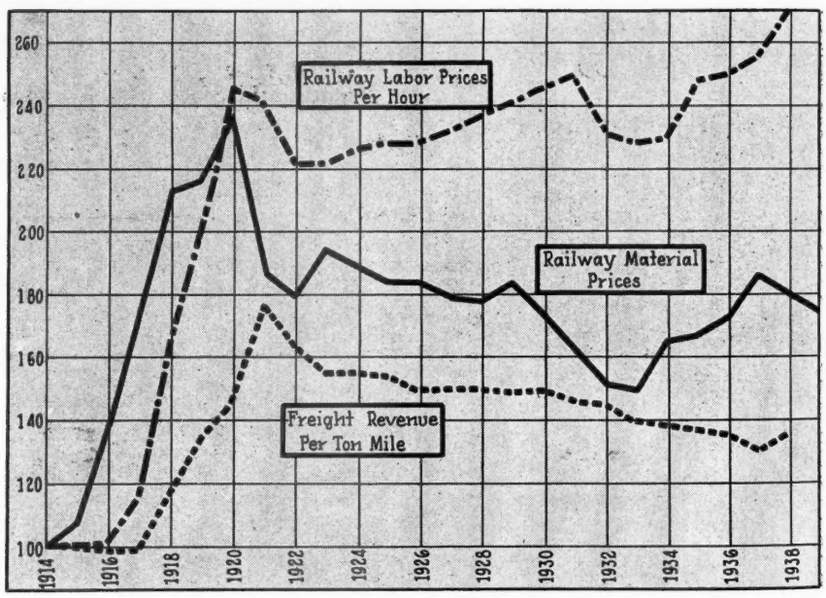
* September.
# Materials and Fuel.

Some Increases in Railway Material Costs

Cross Ties Ready for 1940 Delivery

By D. A. Steel
Purchases and Stores Editor

Tie and lumber prices advanced; Steel unchanged; Big scrap business



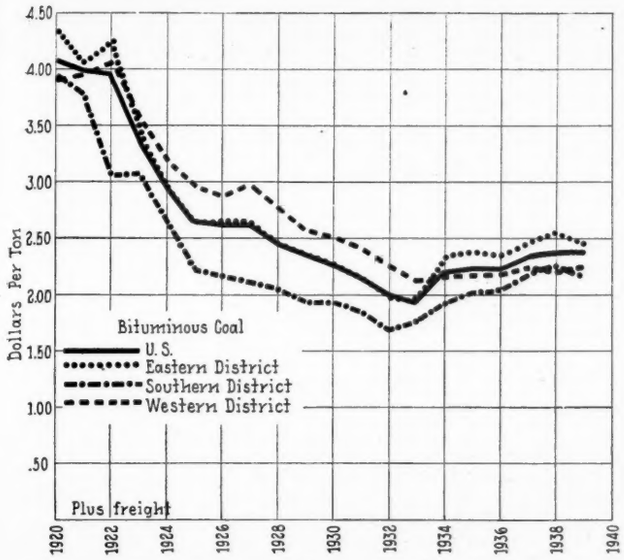
All-Year Weighted Average Costs of Railway Materials. 1914 equals 100

ALTHOUGH, following the outbreak of war in Europe last September, this country was swept by a wave of buying which swamped manufacturing facilities for several weeks and threw the markets for railway materials and equipment into confusion, the railroads came through the experience with fewer and smaller increases in their material costs than in any similar occurence, and fears of further increases have since been appreciably allayed by the more orderly and also the diminished rate at which new business is now being created.

The full effect of severe market dislocations on railway material costs never materializes at once and is usually greater than can be shown statistically, as where inspection is waived by buyers in their hurry for material and concessions are withdrawn by sellers. However, the railroads received some protection from their standing contracts or joined in the scramble to buy materials before proposals to increase prices could materialize, and manufacturers of durable goods cooperated with the government to prevent a runaway market, such as prevailed in 1936 and 1937, by repeatedly withholding increases in their basic prices. Most materials were therefore purchased at the same or even lower prices than in 1938 and, with a principal exception of lumber and raw materials, the increases in prices were not sufficient in number or degree to change aggregate costs perceptibly.

Fuel Fractionally Lower

Bituminous coal in the aggregate averaged 12 cents a ton more at the mine last April and May than in April



Trend in All-Year Average Costs of Coal for Locomotives

and May of 1938 because of a coal strike but there was no increase in the all-year average cost of coal, the average cost of $1.91 per ton at the mine to all railroads in October being one per cent under the average at this time a year ago. The average for 1939 was 21 per cent higher than in 1933 and five per cent less than in 1929. The average cost of coal purchased in 1939, amounting to $2.36 including freight, was 41 per cent less than in 1920.

Fuel oil for locomotives, at 83 cents a bbl. for the year 1939, averaged nine per cent under the all-year average of 1938 and averaged four per cent less in October than in January and six per cent less than in October, 1938. Fuel oil in the aggregate is now costing the railroads 43 per cent more than in 1933, but five per cent less than in 1929 and 49 per cent less than in 1920.

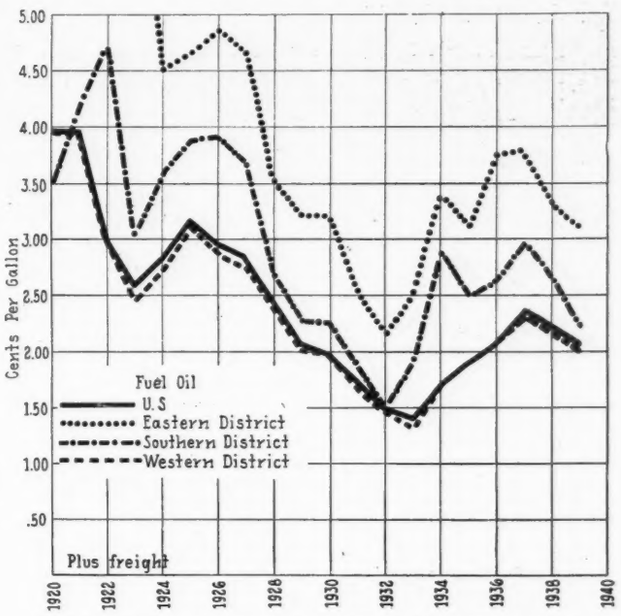
Bulk gasoline to railroads increased nine per cent in cost from March to October but averaged six per cent under 1938 and is still averaging three per cent below the average at this time a year ago and, at 8.24 cents per gallon, is less than half the retail price. The railroad average is 35 per cent less than in 1927 and 1929. Diesel fuel, averaging 4.36 cents per gal. in October was 0.17 cents higher than in June but less than a year ago and the all-year average for 1939 was two per cent below the average for 1938.

The railroads are now offering from 5 per cent to 20 per cent more for untreated crossties, after paying about five per cent less on the average than in 1938. The all-year average cost of untreated ties laid in 1939 was 13 per cent more than in 1933, 20 per cent less than in 1929 and 62 per cent below 1920. Treated ties, at $1.25 each in 1939, averaged higher than any year since 1932 but showed a 42 per cent decline from 1921.

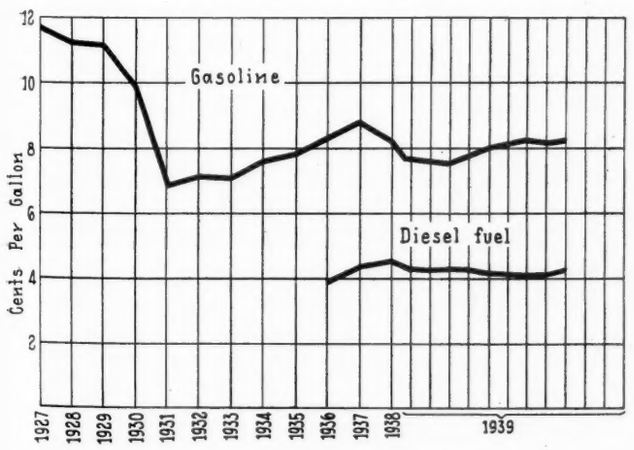
During the past year lumber prices averaged six per cent above 1938, about five per cent higher than in 1929 and about double the prices in 1932 when lumber values were lowest. They were from 15 to 25 per cent higher in October than 12 months previous but have declined fractionally since that time.

New rail at $40 a net ton without extras for special treatment and inspection is unchanged from 1938. Prices paid by railroads for other products of iron and steel averaged two and one-half per cent less in 1939 than in 1938 and now average about two per cent higher than a year ago. The all-year average last year was 21 per cent higher than in 1933 and two per cent over 1929.

Miscellaneous materials, including products of copper and lead, building materials and station supplies, cost the railroads about two per cent less on the average than in 1938 and now average about four per cent higher than a year ago. Prices of appliances for locomotives and cars are unchanged. The railroads paid about eight per cent more for freight cars and about three per cent more for steam locomotives, while Diesel electric locomotive prices declined about 10 per cent. Prices obtained last year for scrap iron and steel receded somewhat after November but averaged 20 per cent higher than the average prices paid in 1938 and ranged about 11 per cent higher than in 1929 and 90 per cent higher than in 1933.



Trend in All-Year Average Cost of Fuel Oil for Locomotives



Trends in Prices of Gasoline and Diesel Fuel Consumed

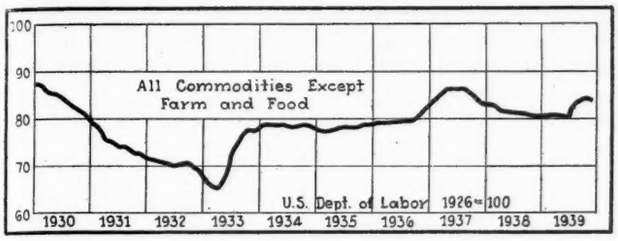
Two Per Cent Gain

According to this paper's weighed average prices, railway materials and fuel, exclusive of scrap and new equipment, cost two per cent less in 1939 than in 1938, five per cent less than in 1929 and 19 per cent more than in 1933, while current prices average two per cent higher

Average Unit Costs of Railroad Materials—1927-1939*

Description	Unit	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939 First quarter	1939 Mid-year	1939 Last quarter	1939 Average	Per cent of 1938	Per cent of 1933	Oct. '39 % of Oct. '38
Track Materials																				
Rail	N.t.	$43.00	$43.00	$43.00	$43.00	$43.00	$42.00	$38.79	$36.37	$36.37	$36.375	$41.33	$41.66	$40.00	$40.00	$40.00	$40.00	97	103	100
Tie plates	N.t.	45.98	42.43	42.10	41.22	38.88	36.40	36.64	39.56	38.73	39.91	44.93	45.45	43.70	43.70	43.70	43.70	96	120	101
Track bolts	Steel	4.00	3.83	3.75	3.94	3.74	3.42	3.52	3.71	3.71	3.87	4.40	4.50	4.31	4.31	4.31	4.31	96	122	99
Track chisels	Heat-treated Cwt.	1.96	1.76	1.74	1.71	1.64	1.64	1.70	1.71	1.79	1.69	1.96	1.86	2.01	2.01	2.01	2.01	108	118	100
Track spikes	Alloy steel Ea.	2.80	2.76	2.71	2.68	2.57	2.45	2.32	2.46	2.46	2.68	3.09	3.54	3.03	3.03	3.03	3.03	85	130	100
Track shovels	High-carbon steel Cwt.	12.95	13.82	11.28	10.02	9.98	10.93	11.53	13.20	13.26	12.70	13.02	13.70	13.51	13.51	13.51	13.51	99	117	98
Bond wire	No. 2 carbon steel Doz.	14.78	17.50	18.56	17.69	15.89	14.48	14.99	16.27	16.33	15.06	18.88	18.90	17.41	17.25	17.75	17.50	92	116	94
Wire fence	35-48 in. cop. clad Cwt.	.467	.488	.426	.428	.396	.383	.370	.402	.416	.403	.502	.516	.475	.469	.470	.473	92	127	96
Steel, structural	26-49 in. woven Rod	1.98	1.98	2.35	1.98	1.84	1.73	1.75	1.93	1.96	2.19	2.48	2.48	2.34	2.34	2.33	2.33	94	133	96
Pipe, cast-iron	Angles Cwt.B.	41.13	41.13	39.41	40.37	35.58	33.94	37.91	40.80	40.60	42.25	42.99	50.58	48.14	48.14	49.43	48.57	96	128	102
Pipe, culvert	12 in. Class B N.t.	...	...	...	...	...	1.95	1.74	2.02	2.16	2.19	2.54	2.59	2.38	2.33	2.32	2.34	91	134	90
Brick	24 in. corr. Ft.	...	...	...	...	...	...	...	...	...	...	12.72	12.60	12.50	12.29	12.80	12.54	100	...	130
Ballast	Common M	...	...	...	...	...	...	...	...	...	...	1.05	.88	.89	.89	.89	.89	101	...	102
	Crushed rock C.y.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Locomotive and Car Materials																				
Bolts, with nuts	¾x6, machine 100 pcs.	5.13	5.02	4.87	4.81	4.20	4.04	4.70	4.59	4.08	3.97	4.93	4.75	4.25	4.22	4.62	4.36	92	93	103
Boiler tubes	2 in. No. 11, steel Ft.	.172	.172	.174	.154	.152	.152	.156	.161	.161	.158	.166	.165	.155	.155	.152	.154	94	99	95
Bar steel	Open-hearth Cwt.b.	2.13	2.58	2.17	1.85	1.80	1.72	1.73	1.84	2.01	2.09	2.49	2.47	2.33	2.25	2.23	2.27	91	131	96
Steel	High-speed tool Lb.b.	.59	.58	.57	.66	.52	.49	.52	.60	.61	.64	.78	.80	.77	.77	.77	.77	96	148	99
Steel	Boiler Cwt.b.	2.01	2.00	2.33	2.01	1.86	1.73	1.82	2.10	2.05	2.12	2.53	2.40	2.25	2.25	2.25	2.25	94	124	99
Steel	Spring Cwt.b.	2.74	2.63	2.84	2.62	2.42	2.18	2.23	2.31	2.36	2.54	3.03	2.94	2.83	2.80	2.80	2.81	96	125	95
Steel	24-gage black Cwt.	3.20	2.99	3.25	2.90	2.65	2.69	2.68	2.72	2.81	2.82	3.28	3.13	2.82	2.78	2.80	2.80	89	104	99
Pig iron	No. 1 G.t.	20.50	20.50	17.35	16.61	15.37	14.85	15.74	18.30	18.59	19.47	22.13	20.97	19.41	19.41	20.74	19.85	95	126	106
Brake shoes	Loco. driving N.t.	61.70	61.70	59.54	60.00	56.28	54.28	54.50	56.30	56.65	56.65	61.36	62.70	63.20	63.20	65.00	63.90	102	118	104
Brake shoes	Freight car N.t.	36.93	39.98	37.55	35.42	35.12	32.70	33.40	35.00	36.00	37.77	48.27	48.50	47.80	47.80	49.70	48.50	100	150	105
Castings, Gray iron	Green sand Cwt.	3.86	3.97	4.12	4.12	4.00	3.82	3.82	3.90	3.87	4.14	4.25	4.15	4.11	4.09	4.10	4.10	99	107	100
Castings, malleable	7-15 lb. 25-100 Cwt.	9.13	8.50	8.68	8.27	7.68	7.59	7.42	8.99	8.29	8.42	10.38	10.50	10.40	10.80	10.80	10.60	101	142	106
Castings, steel	25-50 lb. under 50 Cwt.	8.64	7.97	8.32	8.46	7.73	7.37	7.25	8.52	8.49	8.52	11.91	12.50	12.10	12.10	12.10	12.10	97	162	145
Couplers, car	5x7x6½ AAR-E Pr.	41.20	40.20	40.20	41.20	39.20	38.13	37.20	40.20	40.20	42.43	51.70	51.50	51.00	51.00	51.00	51.00	99	137	101
Wheels, car	33 in. chilled iron. Cwt.	...	...	...	...	...	...	1.35	1.40	1.40	1.40	1.50	1.24	1.27	1.27	1.27	1.27	102	94	104
Wheels, car, steel	33 in. tender 800-lb. Ea.	...	...	...	...	...	...	...	...	...	...	30.60	34.53	33.64	33.64	33.64	33.64	98	...	101
Axles, loco	Driving, carbon Cwt.	5.16	5.21	4.84	4.29	4.75	4.55	4.56	4.90	5.06	5.26	5.94	5.80	5.86	5.82	5.82	5.83	100	127	102
Axles, car	5x9, rough turned Cwt.	2.94	2.94	2.94	2.88	2.88	2.75	2.53	2.89	2.98	3.09	3.61	3.54	3.41	3.41	3.41	3.41	100	135	100
Tires, frt. loco.	33 in., rough bored Cwt	2.94	2.94	2.84	6.22	6.03	5.86	5.55	5.67	5.97	5.83	6.21	6.20	6.12	6.12	6.12	6.12	99	110	100
Pipe	1 in. black steel Ft.	6.11	6.11	5.84	6.22	6.03	5.86	5.55	5.67	5.97	5.83	6.21	6.20	.070	.070	.070	.070	95	111	101
Wire nails	Common Cwt.b.	.076	.069	.066	.067	.069	.063	.063	.066	.069	.062	.073	.074	2.55	2.50	2.50	2.51	92	112	98
Pig lead	Virgin Cwt.	2.58	2.62	2.62	2.29	2.07	2.18	2.23	2.62	2.83	2.28	2.71	2.72	5.00	5.10	5.75	5.30	104	127	108
Copper	Sheet, soft Lb.	7.04	6.43	6.95	5.64	4.42	3.53	4.17	4.04	4.44	4.87	6.34	5.12	.249	.244	.241	.252	.245	99	145	102
Journal bearings	AAR Lb.	.218	.23	.27	.259	.181	.180	.169	.180	.211	.212	.252	.249	.244	.241	.252	.245	99	145	102
Wire, copper	No. 9 bare Lb.	.142	.141	.167	.149	.10	.07	.081	.093	.096	.106	.139	.114	.124	.112	.129	.122	106	151	112
		.149	.167	.195	.163	.115	.100	.113	.138	.141	.142	.185	.163	.169	.157	.169	.165	101	146	103
Miscellaneous																				
Boiler lagging	1¼x6x36 mag Sq. ft.	.21	22	.236	.160	.155	.156	.156	.157	.160	.154	.183	.182	.184	.182	.182	.183	100	117	100
Fire brick	Soft M	41.74	43.08	41.73	41.85	39.29	34.70	37.20	44.58	45.26	45.64	50.42	49.75	49.10	49.00	49.20	49.20	99	132	100
Hose, air brake	Air brake, 1⅜x22 Ft.	.48	.46	.44	.45	.37	.33	.31	.39	.41	.40	.44	.38	.35	.35	.37	.36	95	115	106
Leather	Belting, 6 in. double Ft.	1.22	1.35	1.39	1.39	1.23	1.27	1.17	1.32	1.31	1.32	1.30	1.26	1.26	1.23	1.23	1.24	99	106	99
Rope	¾ in. manila Lb.	.217	.199	.199	.189	.153	.142	.127	.142	.130	.167	.180	.168	.149	.147	.167	.154	92	121	104
Cable	¾ in. 6x19 steel Ft.	.125	.119	.144	.14	.143	.132	.137	.155	.161	.161	.174	.174	.164	.161	.164	.163	94	119	97
Rubber, red	⅛ in. sheet packing Lb.	.32	.28	.247	.25	.225	.176	.172	.177	.167	.131	.141	.137	.135	.135	.136	.135	99	79	100
Gasoline	Plus tax Gal.	.116	.109	.109	.102	.082	.084	.078	.086	.085	.089	.092	.074	.066	.062	.070	.066	89	85	98
Oil	Switch lamp-tanks Gal.	.096	.09	.087	.117	.062	.061	.051	.053	.052	.055	.055	.059	.056	.055	.055	.055	93	108	95
Oil	Car-tank lots Gal.	.180	.157	.157	.163	.138	.127	.134	.135	.132	.141	.132	.144	.144	.143	...	.147	102	110	103
Grease	Driving box Lb.	.160	.122	.125	.131	.122	.118	.109	.104	.103	.102	.101	.100	.099	.099	.099	.099	99	91	99
Waste	Colored cotton Lb.	.098	.091	.086	.084	.076	.051	.057	.065	.057	.073	.079	.058	.062	.059	.060	.060	103	105	107
Creosote oil	Tank lots Gal.	.157	.157	.145	.130	.115	.108	.093	.106	.116	.109	.123	.125	.130	.130	.130	.130	104	140	103
Glass	24x24 dsa. Box	5.23	5.10	5.76	5.84	4.80	4.71	5.18	4.59	5.03	4.81	5.60	5.25	5.06	5.08	5.05	5.06	97	98	101
Linseed oil	Boiled Lb.	.088	.093	.117	.120	.09	.068	.087	.095	.103	.104	.117	.10	.093	.095	.102	.096	96	111	112
White lead	In oil-100 lb. keg Lb.	.11	.102	.104	.106	.107	.088	.08	.081	.085	.085	.100	.086	.086	.091	.096	.091	105	113	114
Cement, Portland	In paper Bbl.	2.21	1.85	1.87	1.76	1.42	1.42	1.80	1.95	2.16	2.02	1.98	1.98	1.89	1.99	1.99	1.99	100	111	100
Soda ash	Water softening Cwt.	1.33	1.40	1.46	1.56	1.55	1.30	1.21	1.31	1.32	1.30	1.20	1.17	1.20	1.20	1.20	1.20	103	99	103
Hydrated lime	Water softening N.t.	13.63	11.99	11.96	9.73	9.53	9.49	8.35	8.50	8.48	8.59	9.47	9.60	9.87	9.81	9.75	9.81	102	117	102
Oxygen	100 cu. ft.	1.29	1.04	1.03	1.05	1.06	1.02	1.04	1.10	1.06	.94	.91	.90	.82	.82	.82	.82	91	79	93
Incandescent lamps	100 W., 110 V. frosted Ea.	...	...	...	...	...	...	...	...	...	...	.161	.128	.115	.115	.116	.116	90	..	94
Lanterns, Hand	With clear globes Doz.	...	...	14.80	14.80	14.80	14.80	15.10	16.00	16.00	16.00	16.00	16.75	16.75	16.75	16.75	16.75	100	111	100
Forest Products																				
Car siding	1x6x9 B&B fir M.ft.	...	...	...	...	...	18.76	25.14	31.40	32.10	32.50	34.16	30.56	32.83	32.83	42.00	35.78	117	142	147
Car siding	1x6x9 B&B pine M.ft.	...	...	...	...	...	...	...	...	...	...	47.11	39.83	38.50	38.25	46.00	40.91	103	..	118
Car sheeting	2x6x18 B&B fir M.ft.	...	...	...	...	...	21.83	36.75	45.00	37.29	47.22	41.50	30.40	30.80	32.30	41.80	35.20	115	96	148
Car sheeting	2x6x18 B&B pine M.ft.	...	...	...	...	...	...	...	...	...	...	45.52	40.36	38.60	39.00	44.60	40.73	101	..	..
Car sills	6x6 com. rgh., fir M.ft.	...	...	...	...	...	10.23	13.00	19.00	17.98	20.20	23.96	20.80	18.75	18.50	23.87	20.37	98	156	125
Br. stringers	16"x32' or less, fir M.ft.	...	...	...	...	...	12.52	15.70	23.50	21.15	20.69	23.23	19.61	18.83	19.25	21.21	19.76	101	84	111
Crossties	7x9x8' 6", fir Ea.	.60	.60	.67	.80	.50	.50	.49	.53	.49	.53	.61	.53	.42	.42	.42	.42	78	86	81
Crossties	7x9x8' 6", pine Ea.	.67	.67	.67	.77	.65	.73	.64	.62	.57	.72	.77	.73	.74	.74	.76	.75	102	115	104
Crossties	7x9x8' 6", white oak Ea.	.98	.95	.93	.92	.83	.75	.69	.69	.67	.82	.96	.82	.81	.84	.87	.84	103	121	103
Railroad Scrap (Sold)																				
	No. 1 wrought N.t.	11.16	11.39	11.96	8.68	7.20	4.20	6.65	7.96	9.07	12.20	13.20	9.90	11.54	11.65	13.83	12.70	128	190	134
	No. 1 heavy melt N.t.	11.63	11.34	12.82	10.62	7.33	5.34	7.32	8.55	9.29	12.32	14.44	11.70	12.93	12.25	16.37	13.83	118	188	134
	Rails for re-rolling N.t.	13.80	12.92	14.49	12.55	10.05	7.18	8.10	9.22	9.89	13.21	15.97	14.00	14.57	14.15	19.20	15.95	114	197	130

* Compiled from special reports made by railroads to the *Railway Age*.



Comparative Trend of Wholesale Prices

than a year ago. Counting the gain from scrap sales, it is estimated that the materials and fuel purchased by the railroads in 1939 cost approximately $25,000,000 less than the same volume of materials would have cost at the average prices prevailing in 1938.

Based on values of 100 in 1914 and 1915, prices of railway materials in 1939 had an index value of 176, as compared with 136 for freight revenue per ton mile and 271 for the hourly compensation paid to officers and employees. In 1917, the corresponding figures were 132 for materials, 99 for revenue and 116 for labor. In 1921 they were 236 for materials, 177 for revenue and 242 for labor. In 1929 they were 178 for material, 149 for revenue and 241 for labor. Since 1914 unit material costs have thus been proportionately greater than earnings but less than unit labor costs.

Deliveries Slow

Last year prices were again marked by the conspicuous degree to which identical prices were paid by different railroads for like materials, including castings and appliances. On the whole, however, lively competition was again evident among dealers for railway business and terms and specifications were observed with one impor-

Weighted Average Cost of Railway Material

1915 = 100

1915	100	1923	179	1931	173
1916	107	1924	194	1932	162
1917	132	1925	189	1933	151
1918	177	1926	184	1934	149
1919	212	1927	183	1935	165
1920	216	1928	179	1936	167
1921	236	1929	178	1937	173
1922	187	1930	180	1938	181
				1939	176

Average Cost of Locomotive Coal Per Ton—Class I Railways 10 Months, 1939

Region and Road	Less Freight† 1938	Less Freight† 1939	Plus Freight‡ 1938	Plus Freight‡ 1939
New England Region:				
Bangor & Aroostook	$4.80*	$4.80*	$5.23	$5.31
Boston & Albany	1.84	1.80	4.70	4.77
Boston & Maine	1.76	1.68	4.55	4.61
Canadian National (In New Eng.)	2.04	1.73	4.72	4.16
Canadian Pacific (In Vermont)	1.95	1.83	5.30	5.18
Central Vermont	1.76	1.56	5.03	4.93
Maine Central	3.29	3.34	4.92	5.12
New York, New Haven & Hart	1.72	1.58	4.19	4.05
Rutland	1.59	1.51	4.21	4.52
Great Lakes Region:				
Ann Arbor	1.80	1.80	3.78	3.76
Cambria & Indiana	2.08	2.05	...	...
Delaware & Hudson	1.91	1.84	3.89	3.68
Delaware, Lack. & Western	1.92	2.16	3.44	3.55
Detroit & Mackinac	1.82	1.87	4.38	4.30
Detroit & Toledo South Shore	1.85	1.80	3.84	3.75
Erie (Inc. Chicago & Erie)	2.08	2.07	2.61	2.68
Grand Trunk Western	1.56	1.34	3.37	3.03
Lehigh & Hudson River	1.80	1.85	4.54	4.59
Lehigh & New England	1.81	1.64	3.22	3.25
Lehigh Valley	1.83	1.87	3.70	3.89
Monongahela	1.88	1.81	2.05	1.96
Montour	2.05	2.03	2.06	2.03
New York Central	1.90	1.91	2.21	2.20
New York, Chicago & St. Louis	1.95	2.05	3.51	3.56
New York, Ontario & Western	1.89	2.08	3.68	3.67
New York, Susq. & Western	2.05	2.08	4.48	4.54
Pere Marquette	1.95	2.00	3.95	3.95
Pittsburgh & Lake Erie	2.01	1.97	2.24	2.19
Pittsburg & Shawmut	2.11	2.13	2.24	2.24
Pittsburgh & West Virginia	1.79	1.76	1.94	1.91
Pittsburg, Shawmut & Northern	2.16	2.15	2.16	2.15
Wabash	1.89	1.80	2.23	2.17
Central Eastern Region:				
Akron, Canton & Youngstown	1.95	1.96	3.36	3.36
Baltimore & Ohio	1.94	1.89	2.03	2.04
Bessemer & Lake Erie	2.07	2.09	2.50	2.31
Central of New Jersey	2.02	2.24	3.69	3.84
Chicago & Eastern Illinois	1.85	1.76	1.98	1.91
Chicago & Illinois Midland	1.75	1.77	1.90	1.92
Chicago, Ind. & Louisville	1.91	1.88	2.07	2.06
Detroit, Toledo & Ironton	1.75	1.84	2.74	2.89
Elgin, Joliet & Eastern	1.94	1.92	2.12	2.05
Illinois Terminal	1.91	1.91	2.05	2.05
Long Island	2.09	2.08	4.63	5.02
Missouri-Illinois	1.74	1.76	1.81	1.88
Pennsylvania	2.02	1.98	2.14	2.17
Penna.-Read. S. S. Lines	1.95	1.94	4.74	5.24
Reading	2.30	2.41	3.68	3.66
Staten Island	2.19	2.19	4.70	4.66
Western Maryland	2.06	2.24	2.22	2.40
Wheeling & Lake Erie	2.03	2.03	2.19	2.15
Pocahontas Region:				
Chesapeake & Ohio	2.10	2.10	2.17	2.18
Norfolk & Western	1.93	1.98	2.00	2.04
Richmond, Fred. & Potomac	1.63	1.48	4.17	3.60
Virginian	1.69	1.67	2.13	2.08
Southern Region:				
Alabama Great Southern	2.28	2.29	2.35	2.38
Atlanta & West Point	2.18	2.19	3.51	3.50
Atlanta, Birmingham & Coast	2.20	2.10	2.47	2.58
Atlantic Coast Line	1.86	1.77	3.61	3.59
Central of Georgia	2.42	2.36	2.56	2.49
Charleston & Western Carol.	1.92	1.90	3.52	3.46
Cin., New Orleans & Tex. Pac.	$2.00	$2.01	$2.38	$2.40
Clinchfield	1.85	1.82	1.96	1.93
Columbus & Greenville	1.47	1.33	2.50	2.43
Georgia	1.85	1.82	3.81	3.76
Georgia & Florida	1.81	1.67	3.67	3.61
Georgia, Southern & Florida	2.13	2.08	3.92	3.90
Gulf & Ship Island	1.63	1.58	3.78	3.73
Gulf, Mobile & Northern	1.36	1.26	2.30	2.31
Illinois Central	1.86	1.88	2.18	2.19
Louisville & Nashville	1.89	1.87	2.05	2.03
Mississippi Central	1.24	1.25	3.30	3.29
Mobile & Ohio	1.74	1.61	1.87	1.75
Nashville, Chat. & St. Louis	2.17	2.16	2.36	2.34
New Orleans & Northeastern	2.16	2.15	4.13	3.99
Norfolk & Southern	1.74	1.77	3.61	3.71
Northern Alabama	2.01	1.96	2.16	1.99
Seaboard Air Line	1.95	1.93	3.15	3.14
Southern	1.86	1.85	1.99	2.00
Tennessee Central	1.79	1.76	2.12	2.05
Northwestern Region:				
Chicago & North Western	1.67	1.43	2.20	1.88
Chicago Great Western	1.44	1.31	2.58	2.24
Chicago, Milw., St. P. & P.	2.09	2.04	2.11	2.36
Chicago, St. P., Minn. & Omaha	1.50	1.47	4.31	4.38
Duluth, Missabe & Iron Range	2.09	2.08	4.62	4.55
Duluth, South Shore & Atlantic	...	...	4.94	4.77
Duluth, Winnipeg & Pacific	...	...	4.78	4.94
Great Northern	1.39	1.22	3.38	3.40
Green Bay & Western	...	...	4.48	5.12
Lake Superior & Ishpeming	...	...	4.97	4.92
Minneapolis & St. Louis	1.75	1.63	1.97	1.90
Minn., St. P. & S. S. M.	1.48	1.40	3.90	3.81
Northern Pacific	1.54	152	2.09	2.03
Spokane International	2.89	2.85	4.31	4.14
Spokane, Portland & Seattle	3.42	2.83	...	...
Central Western Region:				
Alton	1.97	1.96	2.21	2.19
Atchison, Topeka & Santa Fe	2.67	2.62	2.85	2.83
Chicago, Burlington & Quincy	1.64	1.68	1.81	1.83
Chicago, Rock Island & Pacific	2.11	2.05	2.36	2.25
Colorado & Southern	2.64	2.61	2.78	2.76
Denver & Rio Grande Western	2.12	2.08	2.18	2.14
Denver & Salt Lake	1.83	1.53	1.57	1.58
Ft. Worth & Denver City	2.66	2.68	5.29	5.31
Nevada Northern	2.07	1.99	5.09	4.92
Northwestern Pacific	2.21	2.24	...	...
Southern Pacific (Pacific Lines)	3.20	3.20	3.55	3.60
Toledo, Peoria & Western	1.40	1.30	1.60	1.40
Union Pacific	2.01	2.07	2.13	2.20
Utah	1.65	1.72	1.57	1.73
Western Pacific	2.12	2.10	3.44	3.39
Southwestern Region:				
Kansas City Southern	1.98	1.87	2.31	2.21
Kansas, Oklahoma & Gulf	2.18	1.80	2.22	2.23
Louisiana & Arkansas	2.16	2.32	...	...
Midland Valley	1.60	1.80	1.86	1.99
Missouri & Arkansas	2.13	2.15	2.76	2.74
Missouri-Kansas-Texas	2.25	2.26	2.61	2.53
Missouri Pacific	1.86	1.85	1.94	1.91
Oklahoma City-Ada-Atoka	...	...	2.75	2.77
St. Louis-San Francisco	2.02	1.95	2.16	2.09
St. Louis, San Francisco & Texas	2.23	1.92	...	...
St. Louis South Western	1.58	1.28	2.36	2.09
Texas & New Orleans	2.67	2.29	...	...

Source—I. C. C.
* F.O.B. Dock.
† Mine Purchases.
‡ Plus freight and handling expenses.

* Compiled from special reports made by railroads to the *Railway Age*.

Rails for re-rolling.....N.t. 13.80 12.92 14.49 12.55 10.65 7.18 8.10 9.22 9.89 13.21 15.97 14.00 14.57 14.15 19.20 15.95 114 197 130

Relative Costs of Railway Material

	1939 to 1938 12 Mos. Index	1939 to 1933 12 Mos. Index	1939 to 1929 12 Mos. Index	Oct. 1939 to Oct. 1938 Index
Coal*	100	121	95	99
Fuel oil	91	143	95	94
Gasoline	95	112	68	98
Ties	97	113	80	96
Lumber	106	119	102	125
Rail	100	103	95	100
Iron and steel	97.5	121	102	103
Miscellaneous	98	117	87	104
Materials	97	122	95	104
Materials and fuel	93	119	95	102
Scrap Iron and Steel	120	192	111	133

*Excluding Freight

tant exception; since September prompt deliveries of material have not been obtained and shipments of a great deal of railway material have been and are still being delayed from three to six weeks, even where the deals were made with wholesalers and jobbers.

Two months ago it was generally believed that railway purchases and prices would be increased this year, but business has moderated noticeably and the prices of many raw materials have declined somewhat. While gunboats are still sinking merchant ships and Russia is now fighting Finland, this country has recovered from its first case of war nerves and the large steel companies have again postponed increases in their basic prices. Railroads now see nothing alarming in the immediate price structure.

A Big Coal Year

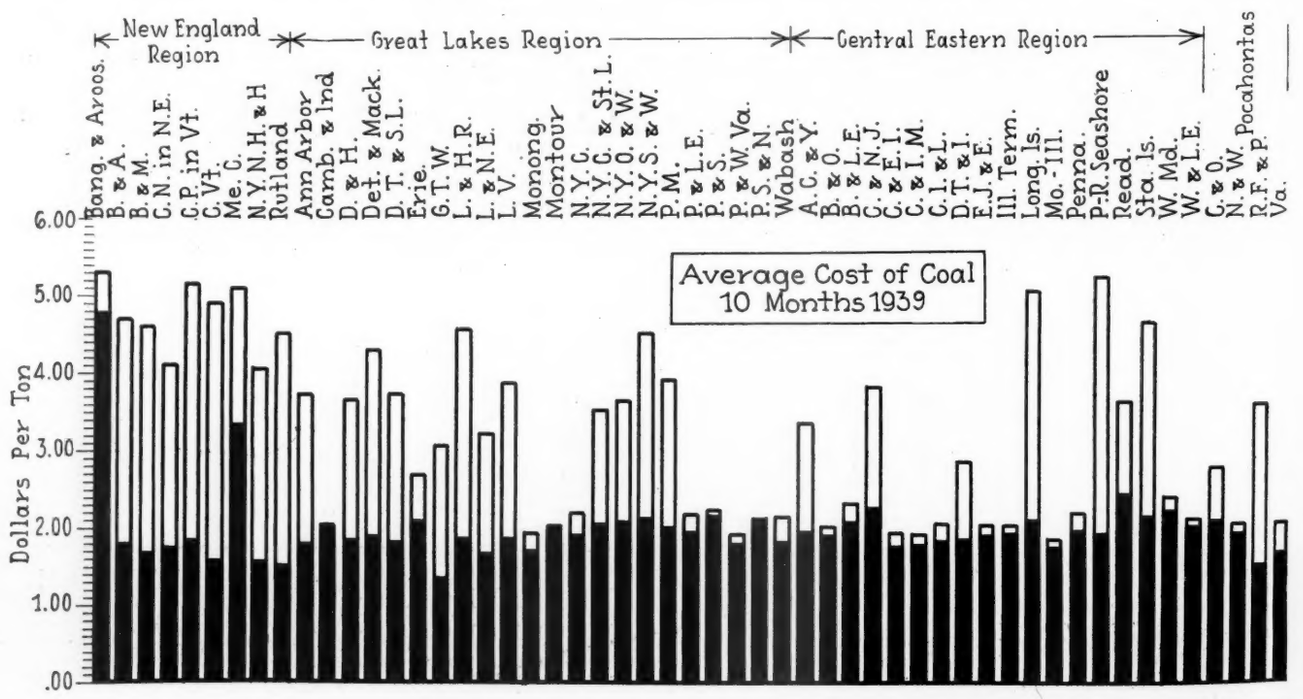
At this time last year the railroads as well as the coal industry (from which they get 30 per cent of their revenues and 75 per cent of their fuel) awaited with concern the conclusion of the second attempt of the National Bituminous Coal Commission to establish minimum prices under the bituminous coal act (popularly known as the Guffey Act) of 1937 and they also awaited the outcome of negotiations between bituminous coal operators and miners over the renewal of the Appalachian wage agreement, scheduled to expire March 31. In both cases the results were unexpected, as the Commission's work was not completed during the year and negotiations over a wage agreement precipitated a strike which put mines in the Appalachian District completely out of production for six weeks and caused a nine-day shutdown in Middle Western states.

The coal commission had approved the proposed average prices of the various district boards which had been created under the law but when these boards failed to reach an agreement in co-ordinating their prices between the various districts the commission undertook the task, only to be repeatedly interrupted. Efforts were first made by various coal producers to secure legislation designed to eliminate the government price fixing and reduce the bituminous coal act to a vehicle for a government supervised marketing agency. Later the

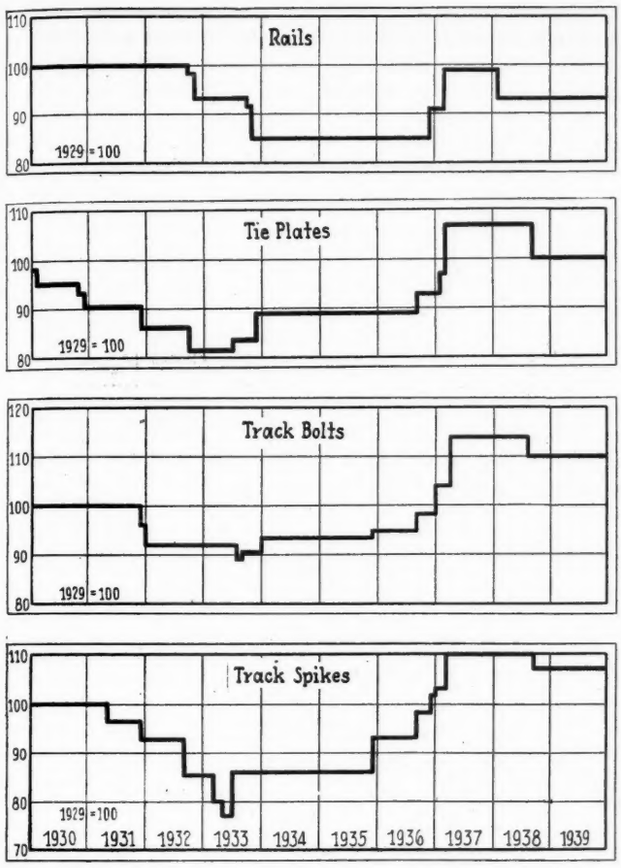
Average Costs of Fuel Oil—Class I Railroads
Cents Per Gallon

	Fuel Oil					
	United States	Eastern District	Southern District	Western District	Gasoline	Diesel Fuel
1920	3.97	9.17	3.49	3.97	...	...
1921	3.77	5.91	4.22	3.75	...	...
1922	2.98	4.75	3.40	2.96	...	...
1923	2.58	7.77	3.05	2.48	...	...
1924	2.80	4.52	3.61	2.75	...	...
1925	3.18	4.67	3.89	3.11	...	...
1926	2.95	4.87	3.92	2.87	...	...
1927	2.80	4.66	3.68	2.73	11.78	...
1928	2.46	3.53	2.69	2.43	11.26	...
1929	2.10	3.24	2.28	2.07	11.08	...
1930	1.99	3.23	2.27	1.95	9.84	...
1931	1.71	2.54	1.87	1.69	6.98	...
1932	1.49	2.17	1.49	1.47	7.12	...
1933	1.40	2.50	1.90	1.30	7.10	...
1934	1.70	3.40	2.90	1.70	7.60	...
1935	1.90	3.10	2.50	1.90	7.80	...
1936	2.10	3.55	2.63	2.04	8.33	3.84
1937	2.35	3.70	2.97	2.30	8.81	4.39
1938	2.21	3.30	2.67	2.18	8.32	4.43
1939†	2.02	3.08	2.21	2.00	7.91	4.25

† Partially estimated.
Source I. C. C.



Average Cost of Coal for Locomotives—10 Months 1939



Comparative Fluctuations in Track Material Prices

coal commission was abolished as an independent tribunal and its work re-organized under a bituminous coal division of the Department of Interior. This left the railroads free all year to contract for their coal supplies without the complications of government price fixing.

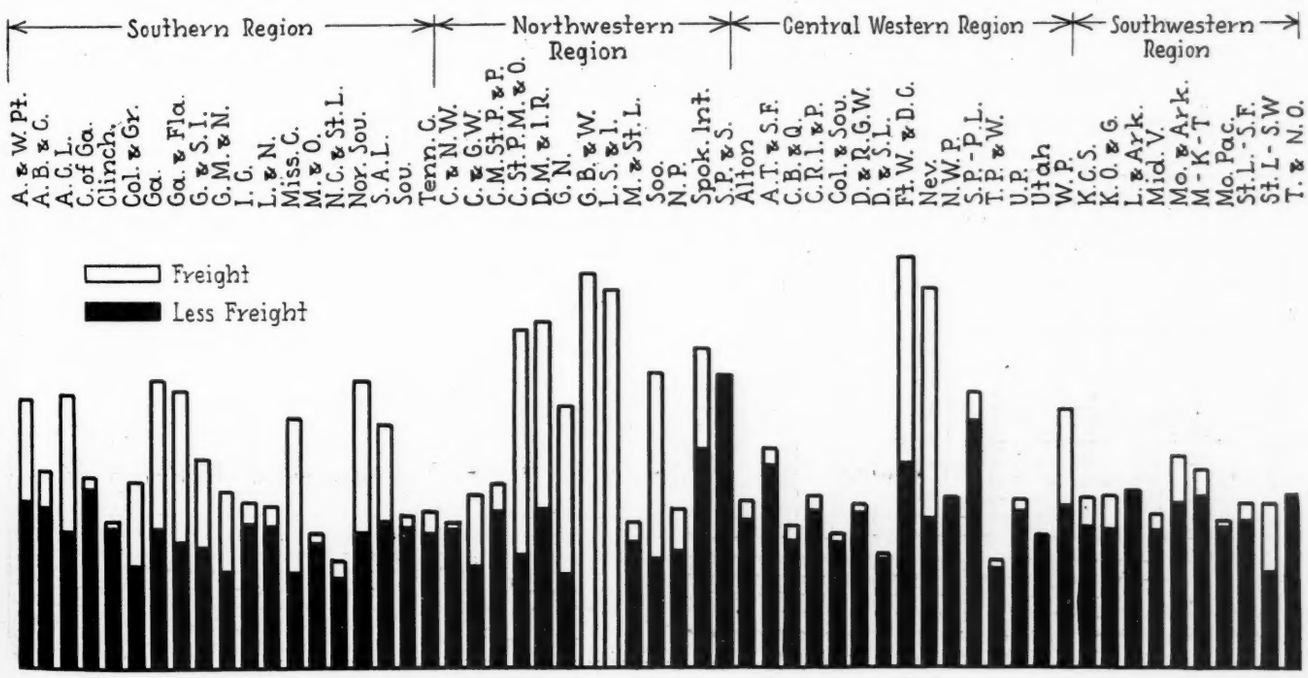
The strike became serious enough to close schools and factories in eastern cities and force eastern railroads and even Pocahontas roads to buy considerable tonnage off line. In general, eastern roads were able to obtain their needs from middle western mines at prices paid by on-line carriers but this was not true of other mines that continued to operate. As a result coal averaged 50 cents or 25 per cent more per ton to roads in the Pocahontas region in April and May than in March and averaged 20 cents or 12 per cent more per ton to roads in the Eastern District. The issues in the strike were closed-shop and penalty clauses rather than wage scales and when the strike was settled on May 15 coal mining was resumed without any fundamental changes in the price structure in-so-far as the railroads were concerned, and costs resumed the level of prices paid in 1938.

While the war in Europe did not produce the demands for export coal which had been anticipated, it gave impetus to coal mining. During late September and also in October the production of bituminous coal crossed the 10,000,000-tons-per-week mark, which is in contrast to the production of only 1,000,000 tons in the week of May 13, and the production for 1939 exceeded that of

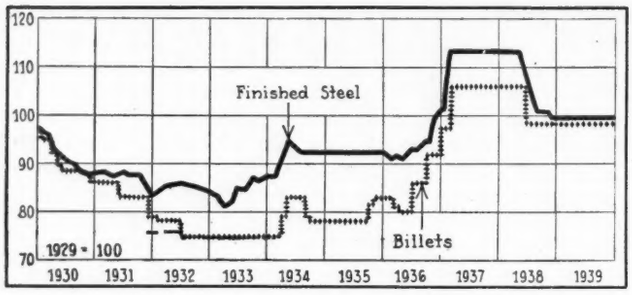
Average Cost of Bituminous Coal Purchased—Class I Railways
Dollars Per Net Ton Plus Freight

	United States	Eastern District	Southern District	Western District
1920	4.07	4.35	3.98	3.88
1921	3.98	4.05	3.79	3.99
1922	3.93	4.26	3.03	4.04
1923	3.38	3.43	3.04	3.53
1924	2.95	2.96	2.56	3.18
1925	2.65	2.66	2.22	2.98
1926	2.62	2.66	2.19	2.89
1927	2.62	2.62	2.13	2.99
1928	2.49	2.49	2.06	2.78
1929	2.35	2.37	1.98	2.60
1930	2.28	2.28	1.95	2.52
1931	2.17	2.16	1.85	2.42
1932	2.00	1.97	1.72	2.27
1933	1.95	1.95	1.68	2.13
1934	2.20	2.35	1.95	2.17
1935	2.23	2.37	2.02	2.17
1936	2.23	2.35	2.05	2.16
1937	2.34	2.49	2.18	2.23
1938	2.36	2.53	2.25	2.20
1939†	2.36	2.45	2.19	2.24

† Partially estimated.
Source I. C. C.



As Reported to I. C. C. Mine Costs Missing Where Not Shown



Comparative Trend in Finished Steel and Billet Prices

1938 by more than 13 per cent, notwithstanding the six weeks shut-down last spring. There was also a 13 per cent increase in the production of anthracite.

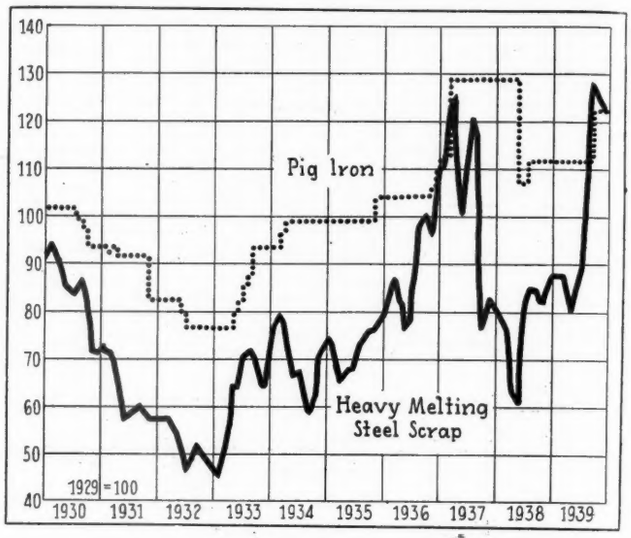
The government is now hurrying to conclude its findings and make its proposed prices effective during the next month or two. If the program succeeds, prices of railroad coal will be increased, otherwise no changes from present levels are likely.

Fuel Oil Unchanged

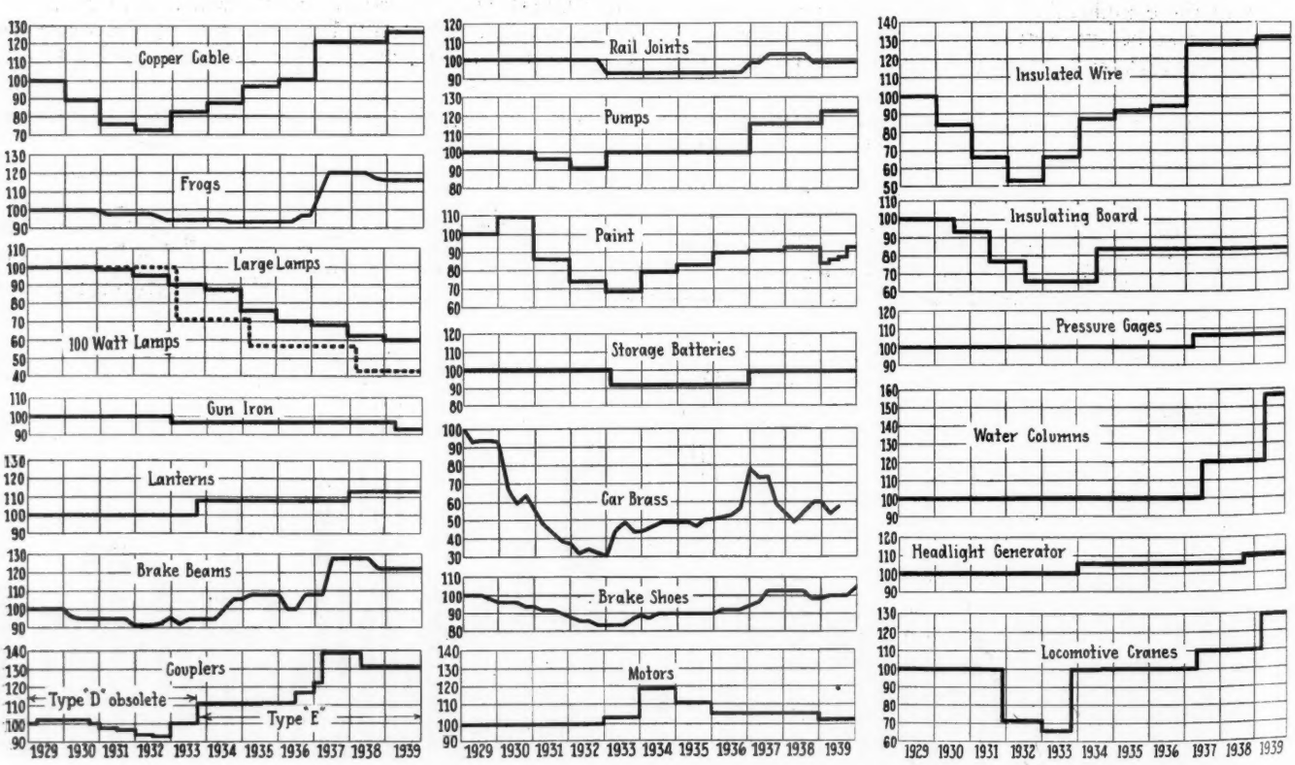
During the first nine months of 1939 Class I railroads consumed 1,865,000,000 gal. of fuel oil, 34,450,000 gal. of gasoline, and 34,680,000 gal. of Diesel fuel. This was six per cent more fuel oil, four per cent more gasoline and 37 per cent more Diesel fuel than was consumed in the corresponding period of 1938. While railroad fuel oil averaged 82 cents a bbl. in October in the aggregate, the average price was 80 cents in the Western District, $1.04 in the Southern District, $1.36 in the Pocahontas District and $1.20 in the Eastern District.

During 1938, in the mid-continent field, crude declined from $1.22 a bbl. to $1.02 and this price was maintained until last summer when petroleum production in the new and unregulated fields of Illinois precipitated a price war which led one of the large producers to cut the price 20 cents a bbl. An enforced two weeks shut-down of oil production in the mid-continent field followed before crude prices were restored to $1.02. Fuel oil purchased by railroads under contracts was not affected by this disturbance but the shut-down raised spot fuel oil prices from an average of 35 cents a bbl. to 45 cents. The bituminous coal industry tried again last year to restrict the importation of oil into this country by adding a duty of 42 cents per bbl. This effort did not materialize and increased importation of petroleum from South American countries and Mexico is now expected under the reciprocal trade agreement which became effective in December.

The effect on railroad fuel oil costs remains to be



Comparative Changes in Pig Iron and Scrap Prices



Comparative Trends of Special Railway Materials and Devices

seen, but it appears probable that fuel oil will be available to the railroads this year at prices similar to those paid during 1939. Gasoline prices may be still further reduced somewhat as a result of the competition of the new field in Illinois where production reached 93,000,000 bbl. last year. However, this field is now being studied with a view to subjecting its production to proration similar to that observed in other states.

A Boom in Steel

Characteristic of conditions in the iron and steel field is the trend of steel ingot production. For two months in 1937 the mills were producing ingots at the rate of 90 per cent of their theoretical capacity, following which production declined to 20 per cent in January, 1938, increased to 35 per cent in April, 1938, and declined again to 23 per cent in June, 1938. It was 60 per cent in November, 1938, and continued at the rate of about 50 per cent until last March when it again declined to 40 per cent, following which steel production staged the most spectacular rise in its history, passing the 90 per cent mark in October and continuing above 90 per cent to the end of the year. Although, with few exceptions, the basic prices established in July, 1938, were successively reaffirmed, the fear of increases, combined with anticipated increases in export business, with national defense plans, and with programs of the railroads to prepare for increased business, etc., served to accelerate buying in all directions and the steel mills were soon compelled to ration incoming orders.

By September 18 pig iron had advanced $2 per ton, and scrap iron, at $17.83 per ton, was the highest in two years. In October, steel plate advanced $5 per ton, bar steel $3 per ton, and cast iron pipe $3 per ton, while scrap iron reached $21.83 and it appeared inevitable that prices would be increased after the first of 1939. However, with the exception of slight increases in fencing, cast iron pipe, machine bolts, and brake shoes, railroad prices were unchanged.

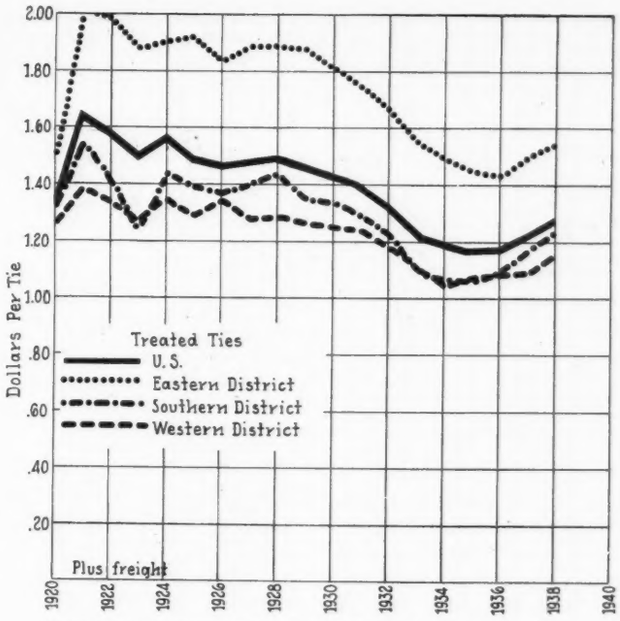
Average Cost of Cross Ties Laid in Replacement—Class I Railroads
Dollars Per Tie

	Untreated				Treated			
	United States	Eastern District	Southern District	Western District	United States	Eastern District	Southern District	Western District
1920	1.20	1.36	1.29	.93	1.35	1.48	1.34	1.26
1921	1.34	1.76	1.21	1.08	1.64	2.10	1.55	1.39
1922	1.03	1.46	.87	.88	1.58	1.99	1.42	1.33
1923	1.05	1.38	1.02	.90	1.49	1.87	1.23	1.26
1924	1.07	1.58	1.07	.91	1.56	1.91	1.44	1.35
1925	.99	1.25	1.02	.85	1.49	1.92	1.39	1.29
1926	.98	1.23	1.04	.81	1.46	1.83	1.37	1.25
1927	.99	1.26	1.04	.82	1.48	1.89	1.40	1.28
1928	.95	1.21	.97	.83	1.49	1.89	1.44	1.29
1929	.93	1.13	.97	.81	1.46	1.88	1.35	1.27
1930	.92	1.12	.95	.82	1.43	1.81	1.34	1.26
1931	.84	1.00	.87	.77	1.39	1.76	1.30	1.25
1932	.70	.92	.70	.66	1.32	1.66	1.24	1.18
1933	.65	1.03	.63	.57	1.22	1.56	1.09	1.09
1934	.69	.77	.77	.57	1.18	1.50	1.07	1.06
1935	.68	.77	.72	.60	1.17	1.45	1.06	1.07
1936	.68	.72	.76	.59	1.18	1.42	1.10	1.08
1937	.77	.80	.87	.67	1.22	1.50	1.17	1.10
1938	.76	.75	.89	.65	1.27	1.54	1.26	1.16

Source I. C. C.

Higher Lumber Prices

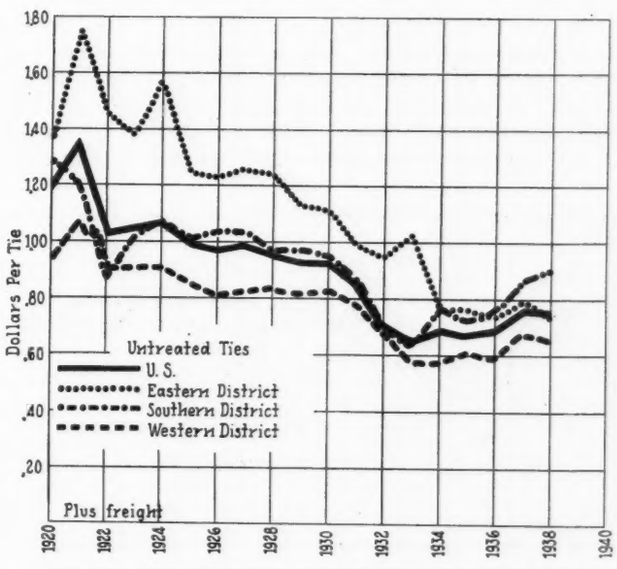
During the 43 weeks of 1939 to November 6, lumber production in the United States amounted to approximately 9,200,000,000 ft. b.m. which was an 18 per cent increase over 1938. In the same period orders on the mills exceeded orders of the previous year by 20 per cent and the orders in September exceeded production by a large margin. Lumber prices are not subject to the control exercised over steel prices and they were substantially increased after July as business activity increased. Two roads paid only $3 more for car sheathing in October than in January and June but prices advanced from $33 to $48 m. bd. ft. to one road and from $38 to $52 to another road. In October car sills advanced from $16 to $20 on one road, from $19.50 to $28 on another road and from $20 to $25 on a third road. While fir stringers cost one road 50 cents less in October than in January, other roads paid from $1 to $5 and the average increase was 20 per cent. There has been some decline in lumber prices since October.



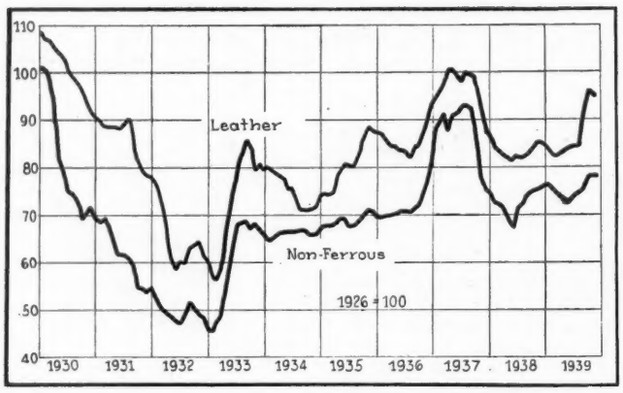
Trends in Average Unit Cost of Treated Cross Ties Laid

Canadian Lumber Higher

In Canada lumber production was supported by a heavier export demand, a good wheat crop, large car building programs by the Canadian railways and by the demands growing out of England's declaration of war on Germany. During the first 10 months, exports of lumber from British Columbia totaled 1,100,000,000



Trends in Average Unit Cost of Untreated Cross Ties Laid



Fluctuations in Leather and Non Ferrous Prices

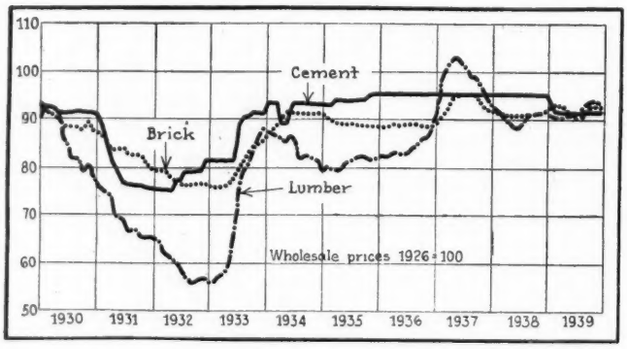
bd. ft., as compared with 870,000,000 bd. ft. in 1938, 848,500,000 bd. ft. in 1937, and 797,700,000 bd. ft. in 1936. Car roofing was advanced from $25 in July to $32 in October. Car sheeting increased from $24 in January and July to $38 in October. Siding increased from $21 to $31, flooring from $22 to $30 and miscellaneous lumber from the price of $13 and $14 in January to $16 and $18 in October. Later it became evident that the demand would be less than expected and export business declined for lack of ships, with the result that prices have generally eased off $1 to $2 in Canada and may decline further.

More Money for Ties

While crosstie prices averaged less to the railroads in this country last year than in 1938, tie buying has been noticeably expanding in almost all sections and higher prices are being offered for crossties for 1940 delivery. One western road in tie territory has offered five cents more for all of its ties since last July and does not anticipate the need of further increases. On the other hand, eastern roads found that increases of $5 to $10 m. bd. ft. which were allowed last summer did not stimulate tie production sufficiently to meet their requirements and have announced further increases to assure adequate production for their 1941 requirements.

British Columbia Car Lumber—1939
Dollars Per M. F.B.M.

	Jan. April	June July	October	Nov.
1 x 4 x 5 roofing	..	25	32	..
1 x 4 x 8 L sheathing	24	24	32	30
1 x 4 x 9 L sheathing	32	33	38	..
1 x 6 x 5 roofing	24	22	30	..
1 x 6 x 8 siding	..	21	31	..
1 x 6 x 18 siding	..	40	45	..
2 x 6 x 9	22	23	30	28
2 x 6 x 16	25	26	33	32
2 x 6 x 18	25	26	33	32

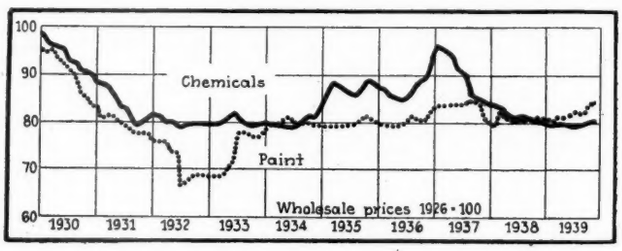


Trend in Wholesale Price of Building Materials

In Eastern territory prices offered for No. 1 ties advanced from 40 cents last February and 45 cents in September to 62 cents in October. No. 2 ties have increased from 45 cents in February and 55 cents in September to 72 cents in October, and No. 3 ties have jumped from 55 cents in February and 77 cents in September to 88 cents in October. No. 4 ties have jumped from 95 cents in September to $1.04 in October and No. 5 ties have been advanced from 80 cents in January and $1.05 in September to $1.17 at the present time. In British Columbia, No. 1 fir ties are quoted at 55 cents, No. 2 fir ties are 41 cents and No. 1 cedar ties are 52 cents at the present time. The opinion is prevalent that the railroads will install more ties in 1940 and that higher prices will be paid in almost all sections during the year.

Higher Journal Brass and Paint

Among miscellaneous materials, those composed largely of copper, lead and zinc were affected most by developments of the past year although many roads bought ahead. Sheet copper, ranging from 20 cents to 30 cents per lb. to railroads, was increased 10 per cent on some roads. Copper wire was increased three per cent and journal bearings were increased an average of 12 per cent, while pig lead moved up eight per cent.

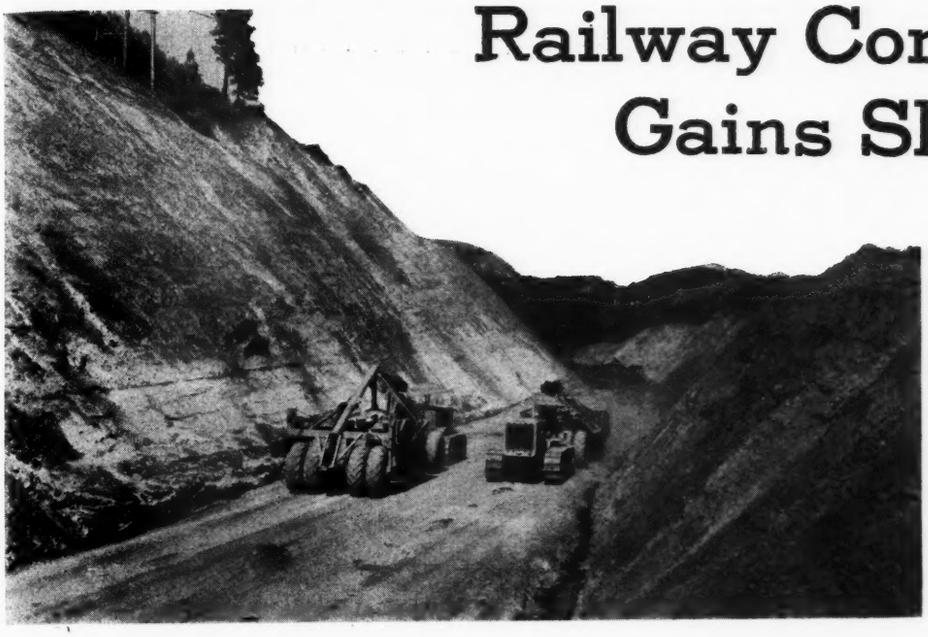


Variations in Wholesale Prices of Chemicals and Paint

Although crude rubber is now averaging 30 per cent higher than in 1938, sheet packing and air hose prices were practically unchanged to the railroads last year and automobile casings declined 15 per cent. Incandescent lamps were unchanged last year but averaged 6 per cent under 1938, continuing the downward trend that has prevailed for more than 15 years. Changes in lubricating oils, waste, leather belting, and boiler and lagging were negligible. Rope averaged four per cent higher in October than a year ago. Glass declined fractionally. Linseed oil and white lead are now 12 to 14 per cent higher than a year ago, oxygen for welding and cutting is unchanged from 1938. Creosote oil averages four per cent higher than a year ago. Cement is unchanged. Brick has risen $2.50 per M. but there has been no perceptible change in the average prices paid for rock ballast or for such commodities as lime and soda ash used in large quantities by railroads for treating water. Among the materials obtained from wholesale houses and jobbers, hair felt increased 30 per cent, plumbing supplies are up 7.5 per cent, roofing 5 per cent, brooms 10 per cent, and building hardware 10 per cent.

Other details and comparisons of prices will be found in the tables and charts. The table of commodity prices is based on averages reported to the *Railway Age* by large railroads in various parts of the country and the figures given are the averages of the prices reported.

Railway Construction Gains Slightly



Cut 95 Ft. Deep, Southern Pacific Line Diversion Around Shasta Dam

Outlook for continued improvement in business foreshadows greater activity in providing badly needed facilities for handling traffic

By George E. Boyd

Associate Editor

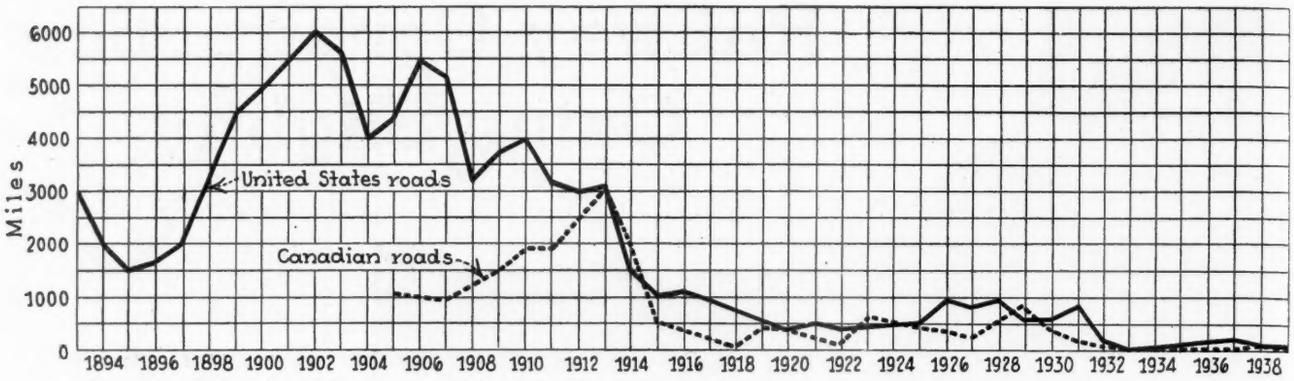
AS was forecast at the beginning of last year, there was a noticeable increase in railway construction during 1939. At that time the prospect for increased earnings was favorable and, as traffic remained at a consistently higher level during the year, while an unprecedented increase occurred during the early fall, the year closed with still better prospects for a further moderate increase in construction activity than for almost a decade.

Since 1929, practically no new construction of consequence has been undertaken by the railways for the purpose of expanding their plant or replacing obsolete facilities, because earnings have remained at so low a level that it has been impracticable to finance projects of any magnitude. Yet during this same period, the requirements of operation and traffic have changed more radically than during any similar period in railway history. Faced with unprecedented competition and an insistent public demand for better service, the railways have developed new methods of operation, with the result that many of the existing facilities are now obsolete although not a few of them were the last word in design at the beginning of the period, and they must be replaced and new facilities must be provided to make these newer methods fully effective. This situation, with respect to both construction and maintenance may be considerably intensified by the movement that is just getting under way, of operating high-speed freight trains to insure earlier delivery of merchandise at distant points. Furthermore, in not a few instances the lack of up-to-date facilities is placing serious obstacles in the way of the development of still other methods that will make possible greater dispatch in the movement of other commodities, or that will permit more economical operation.

As a result of the large amount of deferred construction that has accumulated and of the many changes in operating methods during this period, more railway facilities are obsolete today than at any previous time, and the need for a vast program of railway construction and reconstruction that will effect practically every type of railway facility has never been so great as at present. With the present favorable outlook for a continued higher level of traffic, and the pressing need for additional and better facilities for handling it, the prospect is that this year will see a considerable increase in construction activity, particularly of the smaller projects, and a moderate increase in the number of more important projects. With business on a permanently better basis, this activity will increase, for there is now a sup-

Miles of Main Track Built in 1939

United States	Number of companies building	First track	Second track	Third track	Fourth track	Total
California	2	1.03	0.18	0.72	0.38	2.31
Indiana	1	12.30	..	..	..	12.30
Kansas	1	8.42	..	..	..	8.42
Massachusetts	1	..	..	..	0.04	0.04
Missouri	1	..	0.19	..	..	0.19
Nebraska	1	33.14	..	..	..	33.14
Texas	1	1.88	..	..	..	1.88
Virginia	1	..	7.52	..	..	7.52
West Virginia	1	1.04	..	..	..	1.04
Total		57.81	7.89	0.72	0.42	66.84



New Lines Constructed in the United States in 1939 Increased to 58 Miles. Those in Canada Decreased to 1 Mile

pressed need for a vast program of improvements that will overshadow all former improvement programs.

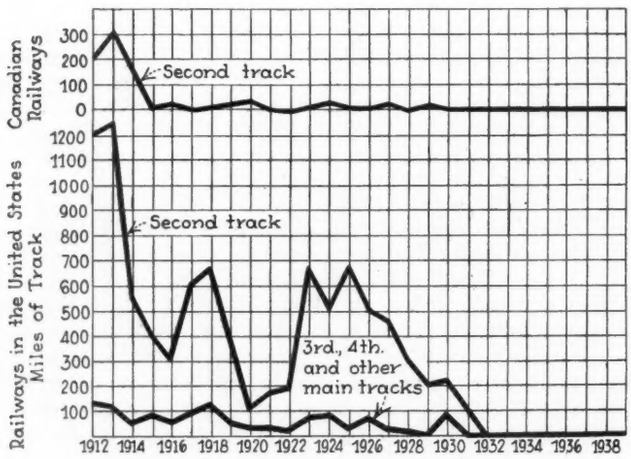
Construction projects fall into two groups—those that can be paid for out of current earnings, and those of such magnitude that the needed funds must be borrowed. During 1939, there was a marked increase in the former group, although this is not reflected strongly in the tabulation at the end of this article, since it includes only those projects costing approximately $100,000 or more. Yet it will be noted that there was also an increased number of more important projects either under way or completed during the year.

Beginning with 1936, there has been an unprecedented amount of grade-crossing separation work in all sections of the country, mainly by reason of federal grants to states and municipalities for this purpose. As the original federal appropriations, amounting to $200,000,000, were exhausted, this construction fell off rapidly as the larger projects were completed during 1937. Subsequent appropriations have been smaller, and in most cases have been applied to individual projects that could be completed in the year for which they were authorized. For this reason, the carry-over from year to year is smaller, but the number of projects each year has been somewhat stabilized.

New Line Mileage Increases

It has been noted for many years that the mileage of new lines under construction or completed during any year provides an excellent index of railway construction activities as a whole, and this belief is fully borne out by analysis of construction records over a long period. Surprising as it may seem, this rule holds good during periods of reduced construction as well as during more active periods. Confirming this trend, 58 miles of new lines were completed during the year, a total that, while insignificant as compared with activities of 30 years ago, is more than 50 per cent larger than in the previous year. It compares with 38 miles in 1938 and with 24 miles in 1933, which latter figure is the smallest since 1830. It is also of interest that several projects are now under consideration, but are being held in abeyance because of difficulties connected with financing them.

During the 20-year period ending with 1919, the mileage of new lines completed annually varied from a

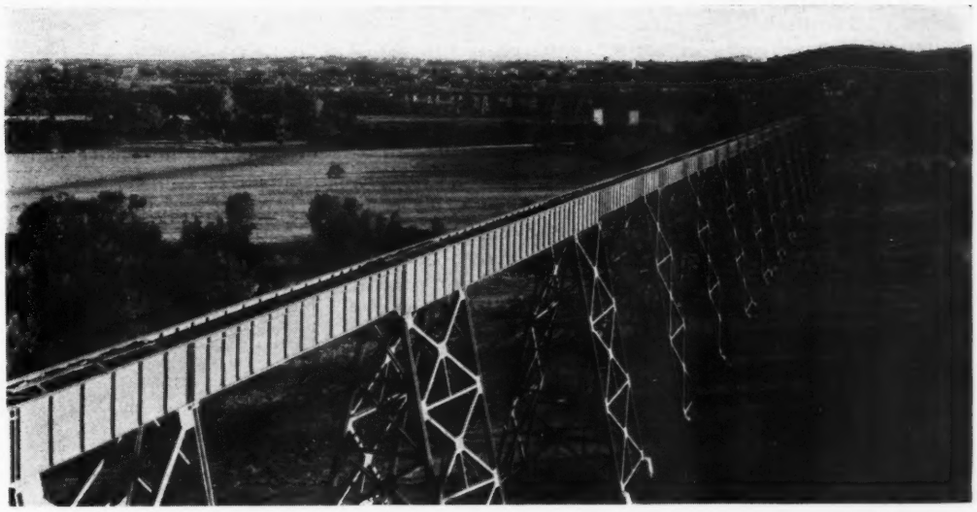


Nine Miles of Multiple Track Completed in 1939

Miles of New Lines Completed in the United States Since 1830

Year	Miles	Year	Miles
1830	40	1885	3,131
1831	99	1886	8,400
1832	191	1887	13,081
1833	116	1888	7,066
1834	214	1889	5,707
1835	138	1890	5,739
1836	280	1891	4,620
1837	348	1892	4,648
1838	453	1893	3,024
1839	386	1894	1,760
1840	491	1895	1,420
1841	606	1896	1,692
1842	505	1897	2,109
1843	288	1898	3,265
1844	180	1899	4,569
1845	277	1900	4,894
1846	333	1901	5,368
1847	263	1902	6,026
1848	1,056	1903	5,652
1849	1,048	1904	3,832
1850	1,261	1905	4,388
1851	1,274	1906	5,623
1852	2,288	1907	5,212
1853	2,170	1908	3,214
1854	3,442	1909	3,748
1855	2,453	1910	4,122
1856	1,471	1911	3,066
1857	2,077	1912	2,997
1858	1,966	1913	3,071
1859	1,707	1914	1,532
1860	1,500	1915	933
1861	1,016	1916	1,098
1862	720	1917	979
1863	574	1918	721
1864	947	1919	686
1865	819	1920	314
1866	1,404	1921	475
1867	2,541	1922	324
1868	2,468	1923	427
1869	4,103	1924	579
1870	5,658	1925	644
1871	6,660	1926	1,005
1872	7,439	1927	779
1873	5,217	1928	1,025
1874	2,584	1929	666
1875	1,606	1930	513
1876	2,575	1931	748
1877	2,280	1932	163
1878	2,428	1933	24
1879	5,006	1934	76
1880	6,876	1935	45
1881	9,789	1936	93
1882	11,599	1937	148
1883	6,819	1938	38
1884	3,974	1939	58

During the 20-year period ending with 1919, the mileage of new lines completed annually varied from a



Bridge Across Sacramento Valley, Redding, Cal., Southern Pacific Diversion Around Shasta Dam

maximum of 6,026 in 1902 to 686 in 1919, the former being the largest mileage recorded since 1888, during the period of feverish railway expansion. During the 20-year period ending with 1939, the largest mileage completed in any year was in 1928, when 1,025 miles were placed in operation, and the smallest was the 24 miles completed in 1933. It is significant that the average mileage completed year by year during the former two decades was 3,358, while the average for the latter period was only 407. These figures point impressively to the fact that the days of large external development are past, and that future expenditures will be made more and more for internal improvements and for the expansion of those facilities that affect the movement of traffic.

Of the total of 58 miles of new lines completed during 1938, the only project that can be classed as an external improvement was that of the Big Four between Buckskin, Ind., and Dickeyville, 12.3 miles. The largest project, however, was that of the Union Pacific between Nevins, Neb., and Lewellen, 33.14 miles, in replacement of a line flooded by the construction of the Kingsley dam on the North Platte river. The next largest project completed during the year was by the Chicago, Rock Island & Pacific, between Kismet, Kan., and Hayne, 8.42 miles, in connection with its grade and line revision across the Valley of the Cimarron river. The remainder consisted of short extensions of existing main lines in connection with and incidental to other construction projects or to provide more suitable connections between adjacent lines.

From 1932 to 1937, inclusive, extension of main-track mileage in Canada was confined to a few projects involving line revisions, and was offset by corresponding abandonments. In 1938, a new line 100 miles long was completed in Quebec, but last year the only new work of this character was at Prince Albert, Sask., in connection with a track rearrangement.

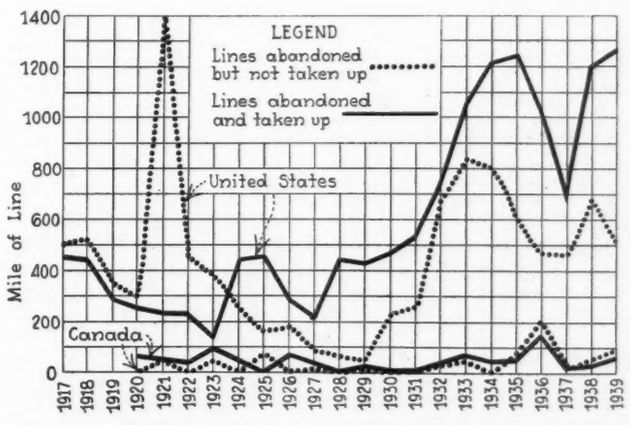
Multiple-track mileage completed in 1939 amounted to only 9.03 miles, of which 7.52 miles of second track was constructed by the Norfolk & Western between Riatt, Va., and Weller Yard. While this is an increase of about 6 miles, compared with 1938, it stands in strong contrast with the more than 1,200 miles of second track completed in 1913 and as much as 600 to 700 miles in several subsequent years. Likewise, during the period since 1912, the mileage of third, fourth and other main tracks has exceeded 100 miles in each of seven years, but has been negligible since 1932. Since 1925, there has been a general trend toward the restriction of multiple-track mileage, as a result of developments in the signaling field which have greatly increased the traffic capacity of existing main tracks, making the construction of additional tracks less necessary. With the further extension of centralized traffic control which is probable, multiple-track mileage should remain low for some years to come.

Miles of New Lines Completed in Canada Since 1904

Year	Miles	Year	Miles
1904	316	1922	145
1905	1,181	1923	655
1906	1,007	1924	615
1907	976	1925	414
1908	1,249	1926	335
1909	1,488	1927	310
1910	1,844	1928	723
1911	1,898	1929	841
1912	2,232	1930	385
1913	3,013	1931	250
1914	1,978	1932	121
1915	718	1933	0
1916	290	1934	1
1917	207	1935	2
1918	135	1936	1
1919	433	1937	0
1920	305	1938	101
1921	252	1939	1

Miscellaneous Construction

Among the larger projects completed or still under construction, the New York Central has continued work on its West Side improvement in New York. While this project is now nearing completion, it is of



Abandonments in the United States Again Exceeded 1,000 Miles. Those in Canada Increased to 151 Miles

such a nature that it has been necessary to carry it out on an orderly schedule of consecutive steps, for which reason it has been spread over a number of years. Among other large projects, the Los Angeles Union Station was completed and placed in service during the early part of the year.

Still other projects include the new mechanical terminal which the Atchison, Topeka & Santa Fe completed at Chicago; the new line of the Chicago, Rock Island & Pacific across the Cimarron river; and the food terminal market constructed by the Union Pacific at Denver, Colo., and the line diversion on the Southern Pacific around Shasta dam.

Construction in Mexico has been practically at a standstill during the year, although a small amount of work has been done on one or two of the new lines, particularly in laying track on previously graded roadbed. There is little prospect of a revival of new line construction in the near future, although several lines are projected.

Abandonments Again Exceed 1,000 Miles

There was a small decrease in the mileage of lines abandoned during the year, the total being 1,783 miles compared with 1,897 in 1938, but the 1939 figure has been exceeded in only four years since the record of abandonments was first compiled in 1917. It is the ninth time during this period that abandonments have exceeded 1,000 miles. The total abandonments for 1939 were 1,625 miles more than the mileage of new lines completed during the year.

The largest single abandonment was that of the Ft. Smith & Western which involved a total of 249 miles of line. However, this included a small amount of trackage rights and certain lines that were sold to other companies, so that the total reduction in main-track mileage as a result of this abandonment was 176 miles. This was also the largest abandonment of an entire line. The second largest abandonment, which was also of an entire railway, was that of the Quincy, Omaha & Kansas City, involving more than 139 miles of line. The Gilmore & Pittsburgh, also a complete abandonment, came third with 120 miles. The St. Louis-San Francisco was in fourth place with 99 miles abandoned between Seymour, Tex., and Salesville. It is significant that 17 entire roads were abandoned during 1939, the largest number on record for a single year. The abandonments reported in any year include all lines abandoned permanently during that year, regardless of whether the tracks have been taken up at the end of the year, and are not included in later years when the tracks of the latter are actually taken up.

Abandonments were not recorded prior to 1917, for the few lines that were discontinued from time to time were unimportant and usually in sparsely populated sections, being generally logging roads or those serving

Miles of Lines Abandoned in the United States Since 1917

Year	Miles	Year	Miles
1917	942	1929	475
1918	959	1930	694
1919	637	1931	795
1920	536	1932	1,452
1921	1,626	1933	1,876
1922	677	1934	1,995
1923	513	1935	1,843
1924	693	1936	1,523
1925	606	1937	1,140
1926	457	1938	1,897
1927	282	1939	1,783
1928	512		

Mileage Abandoned 1932 to 1939, Inclusive

	1932	1933	1934	1935	1936	1937	1938	1939	Total
Alaska	....	18.27	....	....	....	3.00	195.20	....	216.47
Alabama	20.82	28.08	36.22	....	42.09	9.95	1.64	21.96	160.76
Arizona	....	126.51	15.49	17.04	....	....	16.00	8.49	183.53
Arkansas	8.17	37.85	51.28	42.35	23.95	83.43	51.10	5.59	303.72
California	0.77	185.65	116.00	70.57	30.57	74.23	34.27	37.71	549.77
Colorado	26.39	56.57	6.31	84.98	86.30	231.46	26.29	77.43	595.73
Connecticut	....	....	....	33.93	....	25.31	50.25	....	109.49
Delaware	....	....	....	....	33.16	....	3.07	....	36.23
Florida	70.09	69.59	28.13	1.47	165.22	....	12.00	40.91	387.41
Georgia	66.41	46.56	126.63	12.34	....	....	85.26	39.70	376.90
Idaho	15.41	....	4.63	46.78	16.00	....	....	84.52	167.34
Illinois	54.83	38.30	160.82	13.90	32.06	87.42	29.41	57.14	473.88
Indiana	14.80	25.66	....	69.70	0.12	....	....	....	110.28
Iowa	53.12	79.51	52.44	83.32	208.75	14.44	120.58	55.88	668.04
Kansas	....	128.97	162.64	236.85	51.33	21.04	....	50.73	651.56
Kentucky	78.17	74.27	22.89	7.86	....	12.81	14.58	2.74	213.32
Louisiana	45.35	35.94	37.48	8.96	6.50	11.46	60.67	28.22	234.58
Maine	8.50	13.95	71.39	8.16	....	35.97	12.84	....	150.81
Maryland	1.00	....	....	25.60	....	3.75	20.23	13.29	63.87
Massachusetts	1.40	....	....	33.37	....	33.26	21.82	67.52	157.37
Michigan	201.99	51.05	71.39	166.20	40.16	64.65	116.65	8.14	720.23
Minnesota	91.07	12.94	53.37	50.93	31.94	23.18	32.91	....	296.34
Mississippi	24.10	33.50	85.57	....	....	....	....	37.45	180.62
Missouri	53.17	25.51	202.65	118.98	48.47	....	91.48	256.51	796.77
Montana	3.80	....	....	18.37	10.31	29.28	....	41.73	103.49
Nebraska	15.21	45.39	4.87	....	....	....	14.66	44.29	124.42
Nevada	....	....	26.27	0.31	....	....	214.71	2.20	243.49
New Hampshire	25.46	....	5.90	63.92	28.61	16.99	28.40	12.18	181.46
New Jersey	....	62.58	21.38	....	60.57	6.32	1.14	3.46	155.45
New Mexico	....	....	41.10	48.02	....	....	....	18.76	107.88
New York	58.32	4.14	30.82	30.58	57.00	29.33	201.12	51.19	462.50
North Carolina	22.24	53.10	18.50	10.00	11.39	25.17	53.82	....	194.22
North Dakota	....	....	....	....	16.36	....	3.56	....	19.92
Ohio	35.43	17.81	....	18.77	66.47	24.08	3.16	26.04	191.76
Oklahoma	....	9.24	79.01	....	8.60	15.95	108.87	222.97	444.64
Oregon	25.92	12.31	7.75	13.00	133.17	....	0.15	17.01	209.31
Pennsylvania	29.75	39.33	77.60	58.64	105.37	33.58	86.63	65.94	496.84
Rhode Island	....	....	....	....	....	16.33	0.58	0.48	17.39
South Carolina	44.05	....	1.54	76.50	25.00	15.80	8.60	13.50	184.99
South Dakota	....	....	24.04	26.65	16.43	....	23.33	....	90.45
Tennessee	74.01	39.81	41.23	64.15	54.84	47.94	2.60	53.44	378.02
Texas	107.10	188.82	126.13	77.81	39.12	44.63	23.96	118.83	726.41
Utah	19.71	3.05	16.19	....	....	6.88	14.70	66.03	126.56
Vermont	....	33.22	....	....	1.00	8.75	26.38	3.87	73.22
Virginia	112.89	51.69	4.80	21.74	....	4.45	47.46	0.66	243.69
Washington	16.36	55.86	12.01	88.35	12.69	10.44	30.10	8.83	234.64
West Virginia	1.36	77.49	26.08	12.13	21.10	8.85	....	14.29	161.30
Wisconsin	24.90	93.14	124.45	39.65	38.18	59.47	6.78	103.40	489.97
Wyoming	....	....	....	41.07	....	....	....	....	41.07
Total	1,452.07	1,875.66	1,995.00	1,842.95	1,522.84	1,139.60	1,896.96	1,783.03	13,508.11

mines, while they occurred so infrequently as to attract little attention. Beginning with 1917, however, in which year 942 miles of main line were abandoned, abandonments have continued on a large scale ever since, the mileage abandoned in individual years having ranged from 282 in 1927 to 1,995 in 1934. During this 23-year period beginning with 1917, a total of 23,892 miles of lines have been abandoned, an average of more than 1,000 miles annually, while only 10,530 miles of new lines have been constructed, leaving a net decrease of 13,362 miles of road.

Of equal interest with the mileage abandoned by individual roads and the total for all roads, is the distribution of these abandonments by states, for the states themselves are vitally concerned. During the eight years ending with 1939 a total of 13,508 miles were abandoned in the 48 states and Alaska. For this eight-year period, Missouri leads with 797 miles, Texas follows with 726 miles and Michigan ranks third with 720 miles. By regions, the abandonments during these eight years have been: New England states, 690 miles; North Atlantic states, 1,215 miles; southeastern states, 2,481 miles; middle-western states, 3,726 miles; northwestern states, 1,018 miles; southwestern states, 3,041 miles; and the Pacific Coast states 1,120 miles.

Prior to 1932, abandonments in Canada and Mexico had been negligible. In 1932 and 1933, however, the Canadian roads abandoned a total of 282 miles and

Lines Abandoned in the United States, Canada and Mexico in 1939

United States	Lines abandoned and taken up miles	Lines abandoned but not yet taken up miles
Alabama & Western Florida		
Chipley, Fla., to Greenhead	19.25	
Greenhead, Fla., to Southport		18.75
Alton		
Bakersfield, Ill., to Reardon	2.81	
Alabama Central		
Booth, Ala., to Autaugaville	8.30	
Atchison, Topeka & Santa Fe		
Hickman, Okla., to Naphtha	6.49	
Naphtha Jct., Okla., to De Noya	2.83	
Havana, Kan., to Cedar Vale	38.73	
Kennedy, N. M., to Stanley	18.76	
Atlantic Coast Line		
Tavares, Fla., to Lane Park	2.91	
Baltimore & Ohio		
Callery, Pa., to Ribold	5.80	
Mill Run Jct., Pa., to Mill Run		1.30
Jones Mills, Pa., to Kregar		3.90
Whites Creek Jct., Pa., to Unamis		8.70
Waterman, Pa., to Luciusboro		1.90
Leiter Junction, W. Va., to Belington		8.40
Boston & Albany		
Ludlow, Mass., to Bondsville	11.14	
Boston & Maine		
South Middleton, Mass., to Wilmington Jct.	6.95	
Pepperell, Mass., to South Milford, N. H.	13.30	
Elmwood, N. H., to Coolridge Crossing		1.78
Oakdale, Mass., to Wheelwright		24.22
Central of New Jersey		
At Bridgeton, N. J.	1.22	
At Atlantic Highlands, N. J.	0.19	
At Allentown, Pa.	0.33	
Central Vermont		
South Barre, Vt., to Williamstown	3.87	
Chesapeake & Ohio		
At Bartow, W. Va.	0.14	
Hocking, Ohio, to Poston	5.97	
Richardson, Ky., to Peach Orchard		2.74
At Fort Monroe, Va.		0.66
Chicago & North Western		
Bain, Wis., to Bassetts	23.95	
Hebron, Ill., to Harvard	15.81	
Bluffs, Ill., to Fulton	3.87	
Galena, Ill., to Hazel Green Jct., Wis.	10.18	
Chicago, Burlington & Quincy		
Norwich, Iowa, to Shenandoah	5.65	
Van Wert, Iowa to Decatur City	9.13	
Birmingham, Iowa, to Batavia	14.57	
Chicago, Milwaukee, St. Paul & Pacific		
Wauzeka, Wis., to La Farge	52.13	
Chicago, Rock Island & Pacific		
Kismet, Kan., to Hayne	12.00	
Muscatine, Iowa, to Nichols	14.49	
Lone Tree, Iowa, to Iowa Jct.	5.32	
Ruskin, Neb., to Nelson	11.92	
Bridgeport, Okla., to Anadarko	37.49	
Altamont, Mo., to Beverly		63.56
Chicago, St. Paul, Minneapolis & Omaha		
Holcombe, Wis., to Hannibal	17.14	
Clackamas Eastern		
Clackamas, Ore., to Swift	17.01	
Clarion River		
At Hallton, Pa.		0.77
Colorado & Southern		
Idaho Springs, Colo., to Silver Plume	16.88	
Dansville & Mount Morris		
Mount Morris, N. Y., to Sonyea		2.35
Deep Creek		
Wendover, Utah, to Gold Hill		45.66
Delaware & Hudson		
Ticonderoga, N. Y., to Baldwin		2.00
Delaware, Lackawanna & Western		
Homer, N. Y., to Apulia	13.87	
At Hopatcong, N. J.		0.54
Denver & Rio Grande Western		
Reliance Jct., Colo., to Ojo	5.41	
Southern Jct., Colo., to Blend	3.35	
Little Cottonwood branch, Colo.		2.04
Erie		
At Kearney, N. J.		1.22
Nanuet, N. Y., to New City		4.05
Escanaba & Lake Superior		
Northland, Mich., to New Kates	8.14	
Fordyce & Princeton		
Cynthiana, Ark., to Duncan	1.12	
Brown, Ark., to Midway	2.00	
Ft. Smith & Western		
Guthrie, Okla., to Okemah	85.16	
Okemah, Okla., to McCurtain		91.00
Gilmore & Pittsburgh		
Armistead, Mont., to Salmon, Idaho		101.73
Leadore, Idaho, to Gilmore		18.29
Great Western		
Maloy, Colo., to Duke	1.66	
Hickory Valley		
At Endeavor, Pa.	3.03	
Illinois Terminal		
Staunton, Ill., to Litchfield	15.25	
Indian Valley		
Paxton, Cal., to Engels	21.36	
Kansas & Sidell		
Kansas, Ill., to Hume	19.40	
Lake Erie, Franklin & Clarion		
Elsa Jct., Pa., to Harvey	0.83	
Lehigh & New England		
Saylorsburg Jct., Pa., to Saylorsburg	5.15	
Bushkill Jct., Pa., to Northampton Jct.	8.68	
Lehigh Valley		
Freeland branch, N. Y.	0.42	
Roselle branch, N. J.	0.04	
Long Island		
Bridgehampton, L. I., to Sag Harbor	4.39	
Louisville & Nashville		
Tennessee Western Jct., Tenn., to Collinwood	16.64	
Minneapolis & St. Louis		
Laurel, Iowa, to Van Cleve	6.72	
Missouri Pacific		
Chapman, Mo., to Creve Coeur	2.33	
Carthage, Mo., to Asbury	17.92	
Kraft Spur, Ark., to Pike	2.47	
Charleston, Mo., to Crosno	11.71	
Mobile & Ohio		
Tidewater, Ala., to Kellerman		13.66
Nashville & Atlantic		
Campaign, Tenn., to Rocky River	12.00	
New Orleans, Natalbany & Natchez		
Natalbany, La., to Grangerville	28.22	
New York Central		
Holcomb, N. Y., to Caledonia	24.11	
Peoria, Ohio, to Bellefontaine	16.20	
At Rockville, Ohio		2.24
At Chauncey, Ohio		1.63
New York, New Haven & Hartford		
Middleboro, Mass., to North Carver	8.09	
Greenbush, Mass., to Kingston	14.12	
At Provincetown, Mass.	0.10	
At Bristol, R. I.	0.48	
Northern Pacific		
Wallace, Idaho, to Burke	6.23	
Beckman, Wash., to Lakedale	1.08	
Okolona, Houston & Calhoun City		
Calhoun City, Miss., to Okolona	37.45	
Pennsylvania		
Leskie branch, Pa.	1.01	
Derby branch, Pa.	1.39	
Liveright branch, Pa.	0.35	
Windber, Pa., to Arrow	1.08	
At Glen Campbell, Pa.	1.37	
Lyons, Pa., to Stoneboro	3.71	
Pennsylvania-Reading-Seashore Lines		
At Atlantic City, N. J.		0.25
Pittsburg & Shawmut		
Colon, Pa., to Ramsaytown	1.53	
Timblin, Pa., to Mill Mine	0.95	
Pittsburgh, Allegheny & McKees Rocks		
At Pittsburgh, Pa.	3.01	

Lines Abandoned in the United States, Canada and Mexico in 1939 (Continued)

United States	Lines abandoned and taken up miles	Lines abandoned but not yet taken up miles
Quincy, Omaha & Kansas City		
Milan, Mo., to North Kansas City	138.78	
Trenton Jct., Mo., to Trenton	0.71	
Rio Grande, Micolithic & Northern		
Mica, Tex., to Micolithic	6.40	
St. Louis-San Francisco		
Wappapello, Mo., to Williamsville	16.73	
Mingo, Mo., to Wappapello		4.77
Seymour, Tex., to Salesville		98.91
St. Louis-Southwestern		
Lufkin, Tex., to Prestridge	10.93	
At Lufkin Jct., Tex.	2.59	
San Diego & Arizona Eastern		
Santee, Cal., to Lakeside	2.78	
Seaboard Air Line		
Adamsboro Jct., S. C., to Adamsboro	1.90	
Southern		
Abbeville, S. C., to Hodges	11.60	
Embreeville Jct., Tenn., to Embreeville	15.40	
Bristol, Tenn., to Bluff City	9.40	
Roseland, Ga., to Williamson	39.70	
Southern Pacific		
Buchli, Cal., to West Napa	6.37	
At Long Beach, Cal.	0.28	
Patagenia, Ariz., to Flux	2.88	
Poston, Ariz., to Florence	5.61	
Susquehanna River & Western		
Duncannon, Pa., to Bloomfield, Jct.	11.15	
Uintah		
Mack, Colo., to Watson, Utah	63.09	
Rainbow Jct., Utah, to Rainbow	4.23	
Dragon, Utah, to Dragon Mine	1.14	
Union Pacific		
Nepac, Nev., to Silica	2.20	
Rock Jct., Cal., to M.P. 5.28	2.58	
Huntsville, Wash., to Dayton	7.75	
Nevins, Neb., to Lewellen		32.37
Ventura County		
South Patterson Jct., Cal., to North Patterson Beet Dump	1.59	
De Bo Jct., Cal., to Petit Beet Dump		1.49
De Bo Jct., Cal., to De Bo Beet Dump		1.26
Western Maryland		
Carolina Jct., W. Va., to Ida May	0.90	
Georges Creek Jct., Md., to Midland	13.29	
Webster Springs Branch, Webster Springs, W. Va.	4.85	
Total	1266.55	516.48
CANADA		
Canadian National		
Bridgton, N. S., to Granville Center	7.63	
Hawkesbury, Ont., to Hurdman	28.50	
Ronnac, Ont., to Greenburn	5.05	
At Prince Albert, Sask.	0.68	
Dombourg, P. Q., to St. Marc		3.95
Farnham, P. Q., to Frelighsburg		17.90
Hawkesbury, Ont., to Hurdman		26.78
Canadian Pacific		
Linwood, Ont., to Listowel	16.20	
Grand River		
East Preston, Ont., to Preston Jct.	1.51	
Newfoundland		
Whitebourne, Newfoundland, to Hearts Content		42.67
Total	59.57	91.30
MEXICO		
El Oro Mining & Railway Company		
El Oro, Mex., to Salitre	33.00	

since then abandonments have ranged from 55 to 399 miles a year. In 1939, a total of 151 miles were abandoned. Only one abandonment, totaling 33 miles, was recorded for Mexico in 1939, although operation is still suspended on several lines.

Following is a detailed report by roads of construction projects completed or still in progress during 1939, the individual cost of which approximates or exceeds $100,000, except grade separations which are recorded regardless of cost:

Railway Construction in the United States

(Figures in parenthesis indicate percentage of completion at the end of 1939.)

Alaska

Important Work Undertaken: Replace wooden bridge over the Matanuska river with steel bridge, mile post 148.3, $123,000 (100). Construction of hotel, McKinley Park, $580,000 (100).

Alton

Grade Crossing Elimination: Overcrossings: Route 77, Mazonia, Ill., $190,800 (100). Route 5, Normal, Ill., $68,500 (100).
Subways: Route 4, Lincoln, Ill., $96,720 (100). Route 169, Springfield, Ill., $61,630 (100).
Grade crossings eliminated by reason of installing flashing light signal protection at other existing grade crossings: Lincoln, Ill., 5 street crossings closed (100). Roodhouse, Ill., 2 street crossings closed (100).

Alton and Southern

Grade Crossing Elimination: Subways: St. Clair Ave. and Route 12, East St. Louis, Ill., $250,000 (15).

Ann Arbor

Grade Crossing Elimination: Subways: Mt. Pleasant, Mich., $95,000 (100).

Atchison, Topeka & Santa Fe

Grade Crossing Elimination: Overcrossings: Salina, Kan. (100). Viaduct at North 63rd St., Oklahoma City, Okla. (100).
Subways: Moon, Ill. (100). Independence, Kan. (100). Platte Ave., Colorado Springs, Colo. (100). Fourth Ave., Ft. Sumner, N. Mex. (100).
(Gulf, Colorado & Santa Fe) Overcrossings: Virginia Point, Tex., (100). Adams St., Temple, Tex. (100). Stephensville, Tex. (100).
(Panhandle & Santa Fe)—Overcrossings: Viaduct at Fifth St., Plainview, Tex. (Started.)
Subways: Pulliam St., San Angelo, Tex. (100).
Important Work Undertaken: Enlargement of mechanical terminal facilities, Chicago (100). Line change, Elmendorf, N. Mex. (100). Two warehouses, San Francisco, Cal. (100).

Atlanta & St. Andrews Bay

Grade Crossing Elimination: Subways: Cottondale, Fla., $95,000 (25).
Important Work Undertaken: Fertilizer warehouse and dock, Panama City, Fla., $200,000 (100).

Atlanta, Birmingham & Coast

Grade Crossing Elimination: Subways: Junction City, Ga., $30,000 (15).

Atlantic Coast Line

Grade Crossing Elimination: Overcrossings: U. S. Route 76, Fair Bluff, N. C., $90,000 (75). Manning Ave., Sumter, S. C., $220,000 (75). Savannah, Ga., joint with Atlantic Coast Line and Seaboard Air Line, $210,000 (100). Route 1, West Bainbridge, Ga., $28,650 (100). Routes 111 and 93, Cairo, Ga., $27,440 (100). U. S. Route 17, Ways, Ga., $95,440 (75). Montgomery St., Savannah, Ga., $45,000 (Under contract). Route 13, Baldwin, Fla., $75,900 (50). Ramer, Ala., $40,000 (100).
Subways: Jones St., Petersburg, Va., $20,000 (100). Harrison St., Hope Mills, N. C., $130,000 (25). Hinson Ave., Haines City, Fla., $200,000 (100).
Relocation of Highways: Between Orangeburg, S. C., and Cameron, $51,000 (100).
Reconstruction of Existing Grade Separation Structures: Third St., Ridgeland, S. C., $25,000 (75).

Baltimore & Ohio

Grade Crossing Elimination: Overcrossings: Singerly, Md., $146,000 (100). Beltsville, Md., $70,000 (100). University, D. C., $250,000 (75). Hancock, W. Va., $900,000 (100). Kanawha, W. Va., $75,000 (100). Fetterman, W. Va., $295,000 (100). Millers Grove, Pa., $60,000 (100). Main St., Akron, Ohio, joint with Erie and Pennsylvania, $1,490,000 (100). Piedmont, Ohio, $100,000 (100). Mallett Creek, Ohio, $110,000 (95). Willow, Ohio, $425,000 (95). Cleveland, Ohio, $725,000 (75). Laramie Ave., Chicago, joint with Chicago Great Western, $640,000 (100). Somerset, Pa., $115,000 (45).
Subways: McGonigle, Ohio, $200,000 (100). Lorain, Ohio, $145,000 (85). Richmond Valley, N. Y., $300,000 (50). Great Kills, Huguenot, N. Y., track elevation, $2,136,000 (75). Tottenville, N. Y., $997,000 (85). Archer Ave., Summit, Ill., $300,000 (5). Hopkins and Marilla Sts., Buffalo, N. Y., $200,000 (40).
Relocation of Highways: Kenilworth, Md., $30,000 (75).
Reconstruction of Existing Grade Separation Structures: Langdon, D. C., $85,000 (100). E. Market St., Akron, Ohio, $215,000 (95). Akron, Ohio, $122,000 (100). Grafton, W. Va., $65,000 (100).
Important Work Undertaken: Howard Street extension, Baltimore, Md., $293,000 (100).

Bangor & Aroostook

Grade Crossing Elimination: Subways: Bridge Street, Van Buren, Me., $67,220 (98).

Belt Railway of Chicago

Grade Crossing Elimination: Subways: 75th St. and Damen Ave., Chicago, $183,000 (88).

Bessemer and Lake Erie

Important Work Undertaken: Filling Plum Creek Viaduct and extending yard tracks, North Bessemer, Pa., $825,150 (50).

Boston and Maine

Grade Crossing Elimination: Overcrossings: Construction of viaduct to eliminate four grade crossings, Rollinsford, N. Y., $80,000 (100). Main St., Tewksbury, Mass., $150,000 (100). Hampstead road, Westville, N. H., $53,000 (10). Hales Crossing, Bernardston, Mass., $162,500 (100). Main St., West Valley Falls, New York, $93,000 (100).

Canadian National (Lines in United States)

Grade Crossing Elimination: Overcrossings: Davison avenue, Detroit, Mich. (100). Lantz avenue, Detroit, Mich. (100).
Reconstruction of Existing Grade Separation Structures: South Ashland avenue, Chicago (100).

Central of Georgia

Grade Crossing Elimination: Overcrossings: Cedartown, Ga., $119,720 (100). Athens, Ga., $26,430 (100). Atlanta, Ga., $29,880 (100). Savannah, Ga., $189,647 (100). Hapeville, Ga., $125,000. (Started). Cuthbert, Ga., $25,000 (20). Buchanan, Ga., $10,000 (25). Junction City, Ga., $18,980 (100).
Subways: Bremen, Ga., $40,000 (10). Raymond, Ga., $27,090 (25). Birmingham, Ala., $100,775 (100). Irondale, Ala., $44,000 (100).
Important Work Undertaken: Fertilizer storage warehouse, Savannah, Ga., $104,000 (75).

Central of New Jersey

Grade Crossing Elimination: Track elevation to eliminate 13 street crossings at grade and two railway crossings at grade, Elizabeth, N. J., $4,600,000 (100).

Charleston & Western Carolina

Important Work Undertaken: Raising 2 steel spans and rebuilding approximately 900 ft. of trestle work; raising and widening approach fills and rip-rapping same, Saluda river, Spartanburg division, $107,000 (100).

Chesapeake & Ohio

Grade Crossing Elimination: Overcrossings: Shadwell, Va., $63,000 (100). Surveyor, W. Va., $35,245 (100). Winifrede Junction, W. Va., $85,850 (100). Groveport road, Columbus, Ohio, $55,000 (100). Riverton, Ky., $100,000 (None).
Subways: Paintsville, Ky., $76,370 (100). Afton, Va., $70,000 (10). Coal Haven, Ky., $110,000 (2). Goodale street, Columbus, Ohio, $145,000 (55). Beardstown, Ind. (100).
Reconstruction of Existing Grade Separation Structures: Afton, Va., $20,000 (100). Waynesboro, Va., $70,000 (10).
Important Work Undertaken: Sprinkler systems, piers 4, 5, 6 and 8, Newport News, Va., $132,400 (100). Eight additional storage warehouses, Morrison, Va., $170,000 (100). Additional yard and tracks, South Charleston, W. Va., $146,960 (100). Extend yard track, Martin, Ky., $105,000 (100). Two cranes and additional track on pier 2 for handling ore, Newport News, Va., $328,000 (3). Home for hospital nurses, Clifton Forge, Va., $110,000 (98). Improvements at passenger station, Charleston, W. Va., $100,331 (98). Rearrange passing siding facilities, Ashland, Ky., to Netherland, $103,280 (98). Yard office building, underpass and tube system, Russell, Ky., $164,000 (10). Replace Calumet grain elevators, South Chicago, Ill., $350,000 (99).
New Lines Under Construction: Huffsville, W. Va., to Cyclone, 9.6 miles.

Chicago & Eastern Illinois

Grade Crossing Elimination: Subways: Milford, Ill., $170,000 (100).

Chicago & Illinois Midland

Grade Crossing Elimination: Overcrossings: Route 142, North of Petersburg, Ill., $65,133 (100).

Chicago & North Western

Grade Crossing Elimination: Overcrossings: Grade separation, Winnetka, Ill., involves track elevation and depression, 9 overhead bridges and 3 subways, $3,450,000 (50). Route 141, Agnew, Ill., $86,000 (90). Route 141, Nelson, Ill., $65,000 (90). Viaduct at relocated crossing, U. S. Highway 16, Sparta, Wis., $83,000 (100). Viaduct carrying State Route 18 over tracks, Bent, Wis., $65,000 (100). U. S. Highway 20, Lone Pine, Neb., $46,577 (100). Viaduct S. Chase avenue, Milwaukee, Wis., $80,000 (50). Eleven span viaduct, Harvard, Ill., $80,000 (50).
Subways: Track elevation to eliminate 3 crossings, Kenosha, Wis., $460,000 (100). Grand Ave., Chittenden, Ill., $100,000 (100). Grange Ave., Milwaukee, Wis., $70,000 (50). U. S. Route 139, new highway, Crystal Lake, Ill., $100,000 (5).
Important Work Undertaken: Construction of locomotive finishing shop and concrete pit, installation of 100-ton drop-pit table and replacement of 50-ft. turntable with an 80-ft. turntable, Chicago, $116,000 (75). Construction of annex to machine shop and installation of traveling crane, Council Bluffs, Iowa, $65,000 (25).

Chicago, Burlington & Quincy

Grade Crossing Elimination: Overcrossings: Cicero, Ill., $700,000 (100). Beverly, Mo., $100,000 (85). Wolbach, Neb., $30,000 (100). Benkelman, Neb., $70,000 (100). Greybull, Wyo., $135,000 (100).
Subways: Cuba, Kan., $65,000 (100). Lincoln, Neb., $150,000 (100). York, Neb., $215,000 (100).
Important Work Undertaken: New passenger station, La Crosse, Wis., including platform, driveways, etc., $105,000 (100).

Chicago Great Western

Grade Crossing Elimination: Subways: Lanesboro, Iowa, $55,000 (100). Lily Lake, Ill., $40,000 (100).

Chicago, Milwaukee, St. Paul & Pacific

Grade Crossing Elimination: Overcrossings: State Highway 54, Bensenville, Ill., $45,000 (95). U. S. Highway 16, Sparta, Wis., $100,000 (85). W. 70th St., Milwaukee, Wis., $50,000 (100). Lincoln Ave., Stambaugh, Mich., $30,000 (100). U. S. 16 and 61, LaCrescent, Minn., $85,000 (30). Reno, Minn., $30,000 (75). 3rd St., Bristol, S. D., $50,000 (100). Marion, S. D., $65,000 (10). 1st Ave., Bowman, N. D., $50,000 (100). U. S. 89, Ringling, Mont., $85,000 (100). Logan St., Harlowton, Mont., $100,000 (100). Meridian St., N. Puyallup, Wash., $60,000 (100). E. 38th St., Tacoma, Wash., $55,000 (50).
Subways: 3.1 miles W. of Libertyville, Ill., $200,000 (85). 43 track subway, Austin Ave., Chicago, $1,210,000 (85). Wrightwood Ave., Chicago, $255,000 (85). N. 2nd Ave., Washington, Iowa, $75,000 (99). N. of Sturtevant, Wis., $220,000 (100). Riton, Wis., $65,000 (100). Maple Valley road, E. of Renton, Wash., $50,000 (100). Lakeview Highway, near Allison, Wash., $85,000 (100).
Relocation of Highways: To eliminate overcrossing, Day County, S. D., $18,000 (100). To eliminate overcrossing, Grant County, S. D., $90,000 (100).
Reconstruction of Existing Grade Separation Structures: Rochester, Wash., $50,000 (100).
Important Work Undertaken: Reconstruct 646-ft. steel bridge over Little Soap Creek, Brompton, Iowa, $108,442 (50). Make building changes and additions to enable the moving of general foundry facilities into the wheel foundry. Install crane, charging facilities and move machinery, Milwaukee, Wis., $113,599 (90). Construct 20-car capacity fruit house, St. Paul, Minn., $110,000 (100).

Chicago, Rock Island & Pacific

First Track: Kismet, Kan., to Hayne, 8.42 miles.
Grade Crossing Elimination: Overcrossing: Viaduct at "K" St., Fairbury, Neb., $100,000 (100). State Highway 117, Stinnet, Tex., $15,000 (100). Cambridge, Iowa, $40,000 (100). Viaduct at 127th St., Blue Island, Ill., $480,000 (75).
Subways: N. 2nd St., Washington, Iowa, joint with the Chicago, Milwaukee, St. Paul & Pacific, $150,000 (100). 48th St., Lincoln, Neb., joint with the Chicago, Burlington & Quincy, $175,000 (100). U. S. Highway 183, Selden, Kan., $64,000 (100). Denrock St., Dalhart, Tex., joint with the Fort Worth & Denver City, $250,000 (80). Pine St., Dalhart, Tex., $86,000 (80). Albert Lea, Minn., $50,000 (10).
Important Work Undertaken: Strengthen, electrify and place sheer booms, combination railroad and highway bridge over Mississippi river, Inver Grove, Minn., $175,000 (95). Construct new fruit and produce terminal, Minneapolis, Minn., $295,000 (100). Grade and line revision Imogene, Kan., to Hutchinson and at Fowler, Kan., and Optina, Okla., to provide ruling grade eastbound between Kansas City, Mo., and Dalhart, Tex., $350,000 (100).
New Line Under Survey: Fruitland, Iowa, to Trenton, Mo., 159.81 miles.

Chicago, St. Paul, Minneapolis & Omaha

Grade Crossing Elimination: Overcrossing: U. S. Route 2, Ashland Junction, Wis., $57,740 (100).

Clinchfield

Grade Crossing Elimination: Subways: St. Paul, Va., $99,015 (50).

Columbia, Newberry & Laurens

Grade Crossing Elimination: Overcrossings: Ballentine, S. C., $60,000 (100). Newberry County, $60,000 (100).

Cumberland & Pennsylvania

Grade Crossing Elimination: Relocation of Highway to eliminate three crossings, Cumberland, Md., $17,000 (100).

Delaware & Hudson

Grade Crossing Elimination: Overcrossings: McRae street, Fort Edward, N. Y., $54,670 (100). Kings Station crossing, Kings, N. Y., $80,000 (100). Broadway, Fort Edward, N. Y., $200,000 (10).
Reconstruction of Existing Grade Separation Structures: Rockland crossing, Douglass, N. Y., $35,000 (100).

Delaware, Lackawanna & Western

Grade Crossing Elimination: Overcrossings: Preakness avenue, Mountain View, N. J. (100). Johnson City, N. Y. (15).
Subways: Sangerfield, N. Y. (100). Dansville-Geneseo highway, Groveland, N. Y. (15). Union road, Cheektowaga, N. Y., joint with the Erie and Lehigh Valley (15).
Relocation of Highways: Lackawanna avenue, Owego, N. Y. (100).
Reconstruction of Existing Grade Separation Structures: Relocation

and reconstruction of overcrossing, route 168, Tobyhanna, Pa. (10). Fenton Road Highway 134, Chenango Bridge, N. Y. (100). Reconstruction of Tonnele avenue bridge to provide divided highway lines, Jersey City, N. J. (100).

Denver & Rio Grande Western

Grade Crossing Elimination: Overcrossings: Hill Top, Utah, $18,000 (100). Keeldar, Colo., $79,000 (90).
Subways: Deer Creek, Colo., $23,000 (100).

Denver & Salt Lake

Grade Crossing Elimination: Overcrossings: U. S. Route 40, Tabernash, Colo., $65,000 (100).

DeQueen & Eastern

Grade Crossing Elimination: Overcrossing: Highway 71, Lockesburg, Ark.

Detroit & Toledo Shore Line

Grade Crossing Elimination: Overcrossings: Erie Township, Monroe County, Mich. (90). West Road, Trenton, Mich., $400,000 (100). Outer Drive, Ecorse, Mich. (100).

Detroit, Toledo & Ironton

Grade Crossing Elimination: Overcrossing: West Road, Trenton, Mich., $400,000 (100).

Duluth & Northeastern

Grade Crossing Elimination: Overcrossings: Cloquet, Minn., $60,000 (40).

Duluth, Missabe & Iron Range

Grade Crossing Elimination: Subways: Highway 61, Duluth, Minn., $100,000.
Relocation of Highways: U. S. Highway 53, Davis, Minn., $95,000 (100).
Important Work Undertaken: Relocation of yard tracks, Hull Rust yard, $218,385 (100).

Elgin, Joliet & Eastern

Grade Crossing Elimination: Overcrossings: Route 63, Sutton, Ill. (100).
Subways: Route 60, Lake Zurich, Ill. (100).

Erie

Grade Crossing Elimination: Overcrossings: Route 6, Clifton, N. J. (100). Construction of two viaducts, one subway and one pedestrian subway to eliminate six crossings, Monroe, N. Y. (5). Goshen, N. Y. (25). Rockville, N. Y. (15). Andover, N. Y. (5). Route 60, Osborn, Ohio (100).
Subways: Route 6, Clifton, N. J. (100). Allendale, N. J. (100). Howells, N. Y. (5). Union Road, Cheektowaga, N. J., joint with Lehigh Valley; Delaware, Lackawanna & Western and New York Central (5). North 6th street extension, Newark, N. J. (100).
Reconstruction of Existing Grade Separation Structures: Kearny avenue, Kearny, N. J. (100). Salisbury Mills, N. Y. (100). Craigsville, N. Y. (5). East Market Street bridge, Akron, Ohio, joint with Pennsylvania and Baltimore & Ohio (100).

Florida East Coast

Grade Crossing Elimination: Overcrossings: West Palm Beach, Fla., $199,800 (100).

Fort Worth & Denver City

Grade Crossing Elimination: Subways: Denrock Ave., Dalhart, Tex., $205,319 (100).

Georgia

Grade Crossing Elimination: Subways: Greensboro, Ga., $100,000 (100).

Great Northern

Grade Crossing Elimination: Overcrossings: Maple, Minn., $11,706 (100). Union Street, Fergus Falls, Minn., $52,540 (100). Fort Browning, Mont., $50,000 (95). Lester, Iowa, $15,000 (100). Hopkins Junction, Minn., $21,000 (100). Cloquet, Minn., $60,000 (75). St. Paul, Minn., $200,000 (100). Bellingham, Wash., $100,000 (Started). Minneapolis, Minn., $50,000 (Started).
Subways: 13th Street, Fargo, N. D., $200,000 (100). Wolf Point, Mont., $95,000 (100). Olney, Mont., $52,000 (100). Stratford, Wash., $136,500 (100). Brewster, Wash., $125,000 (100). Perkins, Iowa, $15,400 (100). Casselton, N. D., $85,000 (100). Robbinsdale, Minn., $140,000 (Started). Devils Lake, N. D., $18,000 (Started). Stanley, N. D., $25,000 (Started).
Reconstruction of Existing Grade Separation Structures: Minot, N. D., $30,000 (100). Francis Ave., Hillyard, Wash., $71,000 (100).

Important Work Undertaken: Construct new power plant and furnish equipment, also direct steaming for 20 stalls in roundhouse, Hillyard, Wash., $173,000 (100). Extension of Hutchinson branch, widening embankments and applying new ballast including the laying of 19 miles of new rail, Minneapolis, Minn., to Hutchinson Junction, $296,600 (100). Widening banks and applying new ballast on 32 miles of main line including 32 miles of new rail, and replacing rail on 7 passing sidings, New Rockford, N. D. to Wellsburg, $661,605 (90). Widening embankments and applying new ballast on 22 miles of main line, including the relaying of 22 miles of rail, extending and laying heavier rail on 4 passing sidings, Dodson, Mont. to Matador, $430,000 (90). Extension to passing siding, applying new ballast to 8.6 miles of main track and relaying rail, Elk, Wash. to Chattaroy, $164,320 (100). Widening banks and applying new ballast to 9.7 miles of main track, relaying rail on passing sidings, Columbia river, Wash. to Appleyard, $184,350 (100). Alterations in freight handling facilities at Hoag Lake, Minn. and between Washington avenue and 7th street, including removal of 14,440 ft. of track and construction of 4,930 ft., construction of freight house and transfer platform, installation of paved driveways and flood lights, $161,600 (100). Replacement of 9 enginehouse stalls 92 ft. long with 11 stalls 134 ft. long, and installation of drop pits and direct steaming, Minot, N. D., $120,500 (100).

Gulf Coast Lines

Important Work Undertaken: Extend Atchafalaya River bridge, Krotz Springs, La., $723,000 (100). Construct high level crossing over Morganza Floodway, Krotz Springs to Lottie, La., $2,500,000.

Gulf, Mobile & Northern

Grade Crossing Elimination: Subways: Lucedale, Miss., $60,000 (100).

Illinois Central

Grade Crossing Elimination: Overcrossings: Starnes, Ill., $160,000 (100). Lincoln, Ill., $160,000 (100). Mt. Pulaski, Ill., $50,000 (100). Stallings, Ill., $60,000 (100). Oglesby, Ill., $40,000 (100). Bloomington, Ill., $80,000 (50). South of Elgin, Ill., $19,500 (100). Center Grove, Iowa, $100,000 (45). Fulton, Ky., $55,000 (100). Graham, Ky., $70,000 (100). Nortonville, Ky., $65,000 (100). Dublin, Ky., $11,000 (100). Rockport, Ky., $97,250 (45). Charleston, Ky., $15,000 (100). Dawson Springs, Ky., $20,000 (100). Memphis, Tenn., $173,000 (100). East of Jackson, Miss., $75,000 (100). West of Jackson, Miss., $50,000 (100). Pickins, Miss., $46,000 (100). Batesville, Miss., $32,000 (100). Shreveport, La., $180,000 (100).
Subways: Tuscola, Ill., $146,000 (100). Linn Street, Springfield, Ill., $100,000 (100). Eldena, Ill., $75,000 (100). Grant Street, Clinton, Ill., $108,000 (100). Central Avenue, Memphis, Tenn., $75,000 (100). Greenwood, Miss., $125,000 (60). Bossier City, La., $200,000 (100). Baton Rouge, La., $50,000 (100).
Reconstruction of Existing Grade Separation Structures: Iola, Ill., $10,000 (30). Bethel, Ill., $10,000 (100).

Illinois Terminal

Grade Crossing Elimination: Overcrossings: Stallings, Ill., (100). U. S. Route 66, No. Lincoln, Ill., (100). Springfield, Ill., (100).
Subways: Route 4, Springfield, Ill., $26,000 (100).

International-Great Northern

Grade Crossing Elimination: Overcrossings: San Antonio, Tex., joint with the Southern Pacific, $161,800 (90). Tyler, Tex., $57,550 (100).
Subways: Kilgore, Tex., $102,590 (40). Longview, Tex., joint with the Texas & Pacific, $272,140 (80). Marlin, Tex., $192,590 (100).

Kansas City Southern

Grade Crossing Elimination: Overcrossings: State Route 14, Joplin, Mo., $220,000 (75). State Route 8, Oil City, La., $92,000 (100).

Kentucky & Indiana Terminal

Grade Crossing Elimination: Subways: 7th Street, Louisville, Ky., $629,000 (10).
Reconstruction of Existing Grade Separation Structures: Market Street, Louisville, Ky., $98,850 (100).

Lake Erie, Franklin & Clarion

Grade Crossing Elimination: Two crossings closed by elimination of 0.83 mile of main track, Ells, Pa. to Harvey.

Lehigh Valley

Grade Crossing Elimination: Overcrossings: Cayuga Creek Road, Barton, N. Y., $200,000 (100). Strattons and Todds Crossings, Newfield, N. Y., $180,000 (5). Alden-Crittenden Road, Wende, N. Y., $96,000 (5). Clinton-Pittstown Road, Grandin, N. J., $138,000 (100). Camptown Road and Wyalusing Road, Wyalusing, Pa., $116,000 (5).
Subways: Union Road, Cheektowaga, N. Y., $500,000 (5).

Litchfield and Madison

Grade Crossing Elimination: Overcrossings: Stallings, Ill., (100).

Los Angeles Union Station

Important Work Undertaken: New Union Station, train shed, interlocking, baggage and express facilities and grade separation structures, Los Angeles, Cal., $10,857,397 (100).

Louisville & Nashville

Grade Crossing Elimination: Overcrossings: St. Clair Ave., E St. Louis, Ill., $260,000 (100). Red Star, Ky., $25,000 (75). Brandenburg, Ky., $50,000 (100). Mannington, Ky., $56,000 (10). Mortons, Ky., $50,000 (25). Chatsworth, Ga., $55,000 (100). Fairmount, Ga., $44,000 (10). Ranger, Ga., $20,565 (100). Elmore, Ala., $35,000 (100). Greenville, Ala., $40,000 (100). Henderson Point, Miss., $211,000 (100).

Subways: 7th and Magnolia, Louisville, Ky., $553,000 (5). Elizabethtown, Ky., $60,000 (100). Gibson Station, Va., $55,665 (100). Elizabeth, Ga., $90,000 (100). Cumberland Avenue, Knoxville, Tenn., $42,957 (100). Oliver Springs, Tenn., $29,271 (20). Springfield, Tenn., $31,200 (25). Englewood, Tenn., $40,000 (100). Birmingham, Ala., $282,000 (100).

Maine Central

Grade Crossing Elimination: Overcrossings: Bartlett, N. H., $40,000 (97).

Relocation of Highways: Cherryfield, Me., $99,500 (100).

Marianna & Blountstown

Grade Crossing Elimination: Overcrossings: Blountstown, Fla., $30,000 (100).

Minneapolis & St. Louis

Grade Crossing Elimination: Overcrossings: Searsboro, Iowa, $15,500 (100).

Minneapolis, St. Paul & Sault Ste. Marie

Grade Crossing Elimination: Overcrossings: Enderlin, N. D., $55,000 (100). Appleton, Wis., $100,000 (100). Turtle Lake, Wis., $80,000 (100). Waupaca, Wis., $75,000 (10).

Subways: Blackhoof, Minn., $60,000 (15). Church Street, Stevens Point, Wis., $180,000 (60). Fessenden, N. D., $75,000 (100).

Important Work Undertaken: Improvement to transfer table, machine shop, car shop and coach shop, Shoreham Shops, Minneapolis, Minn., $100,000 (100).

Missouri-Kansas-Texas

Grade Crossing Elimination: Overcrossings: Greenville Road, Dallas, Tex., $140,000 (100).

Subways: Sterrett, Tex., $65,000 (100). 4th Street, Taylor, Tex., $183,134 (100). Pryor, Okla., $60,000 (100). Oswego, Kan., $81,607 (100).

Relocation of Highways: Alvarado, Tex. to Grandview, $160,000 (80).

Important Work Undertaken: 4.9 mile spur track and sidings to serve Red River dam construction, Denison, Tex., $120,000 (100).

Missouri Pacific

Second Track: St. Louis, Mo., 0.19 miles.

Grade Crossing Elimination: Overcrossings: U. S. Route 50, Greenwood, Mo., joint with the Chicago, Rock Island & Pacific, $160,000 (1). Minnesota Avenue, Kansas City, Kan., joint with the Union Pacific, $303,800 (100). U. S. Route 50, Overbrook, Kan., $36,000 (30). U. S. Route 75-160, Independence, Kan., $168,800 (3). U. S. Route 71, Texarkana, Ark., joint with St. Louis-Southwestern, $172,000 (20). U. S. Route 64, Gleason, Ark., $71,600 (100). U. S. Route 82, Montrose, Ark., $130,000 (0). Canaan, Ark., (1). U. S. Route 165, Galion, La., $114,400 (100). Murray, Neb., $50,000 (100). Seymour Park, Neb., joint with the Chicago, Burlington & Quincy, $60,000 (100). Hastings, Neb., joint with the Union Pacific and Chicago & North Western, $300,000 (0).

Subways: Chippewa Street, St. Louis, Mo., $330,000 (80). St. Louis, Mo., $330,000 (1). U. S. Route 59, Garnett, Kan., $72,600 (100). Eads, Colo., $90,000 (100). Ft. Gibson, Okla., $60,000 (0).

Relocation of Highways: U. S. 165, Standard, La., to Urania, $170,000 (60). U. S. 165, Rochelle, La. to Lincecum, $160,000 (60).

Important Work Undertaken: Relocation of facilities account levee setback, Vidalia, La., $164,300 (100). Bridge 314, reconstruct pivot pier, Newport, Ark., $111,000 (100). Extend boiler room and install equipment, Kansas City, Mo., $113,080 (100).

(Natchez & Louisiana) Relocation of facilities account levee setback, Vidalia, La., $128,000 (100).

Mobile & Ohio

Grade Crossing Elimination: Overcrossings: Dwight, Ala., $50,000 (100). Quitman, Miss., $50,000 (100).

Subways: Crawford, Miss., $50,000 (100).

Important Work Undertaken: Banana house, office and loading tracks on pier, Mobile, Ala., cost not determined (10).

Murfreesboro-Nashville

Grade Crossing Elimination: Reconstruction of Existing Grade Separation Structures: Reconstruction of overhead bridge because of relocation of highway, Murfreesboro, Ark., $500 (100).

Nashville, Chattanooga & St. Louis

Grade Crossing Elimination: Overcrossings: Cedar street, Murfreesboro, Tenn., $76,200 (40).

Subways: Willett street, Memphis, Tenn., $366,690 (65), joint with the Union Railway.

Nevada Northern

Grade Crossing Elimination: Overcrossings: U. S. Route 50-93, East Ely, Nev., $75,000 (100).

New York Central

Grade Crossing Elimination: Overcrossings: 11th avenue viaduct, New York, $1,031,500 (100). Reconstruction of 30th street yard, New York, $5,964,000 (20). Main street, Bogota, N. J., $406,900 (100). Powell avenue, Dock Junction, Pa., $233,300 (75).

Subways: Blossom road, Brighton, N. Y., $408,100 (100). White Plains road, Elmsford, N. Y., $78,700 (100). Pleasantville road, Thornwood, N. Y., $279,850 (100). Lorain avenue, Cleveland, Ohio, $831,700 (100). Route 154, Seatonville, Ill., $76,000 (100). State Highway 55, Toledo, Ohio, $87,378 (60).

Relocation of Highways: Montrose, N. Y., $155,000 (100).

Reconstruction of Existing Grade Separation Structures: State Highway 5366, Catskill, N. Y., $78,400 (50). Churchville, N. Y., $198,000 (100). East Buffalo, N. Y., $266,800 (100). Palatine Bridge, N. Y., $80,000 (50).

Important Work Undertaken: Covering over tracks West 79th street to St. Clair place, except West 94th to West 98th street, structure No. 5, New York, $13,000,000 (100). Express highway beween St. Clair place and Dyckman street, structures No. 6, 7 and 8, New York, $8,000,000 (100). Boulevard Underpass, 135th street and Park avenue, New York, $360,000 (100). Extension of passenger platforms between tracks 107, 108, 109 and 110, Grand Central Terminal, New York, $108,000 (100). Alterations to ground floor of 466 Lexington Avenue building for store at corner of 45th street and Lexington avenue, New York, $120,000 (70). Cross County Parkway viaduct over Bronx River valley and railroad, north of Fleetwood station, Fleetwood, N. Y., $270,000 (100). Bridge carrying railroad over Cross County Parkway, south of Dunwoodie station, Dunwoodie, N. Y., $170,000 (100). New substation, 126th street and Park avenue, New York, $220,000 (100). Reconstruction of bridge P-10-A, Mosholu avenue, Van Cortlandt, N. Y., $127,000 (100). Existing coaling plant replaced by a new mechanical steel and concrete plant, together with a new arrangement of tracks and other facilities, East Syracuse, N. Y., $277,000 (100). Filling in and retiring bridge No. 74, Newburgh, N. Y., $190,000 (80). Raising bridge U-3 over N. Y. State Barge canal to increase underclearance, Utica, N. Y., $165,000 (100). Dredge the slip between docks No. 1 and 2 to a depth of 24 ft. below low water datum and the area between the easterly channel line of the river and the westerly bulkhead of dock 1 to a depth of 22 ft. for a distance of 2,000 ft. upstream, Ashtabula Harbor, Ohio, $175,000 (5). Alter and protect 31 bridges and culverts which cross side streams tributary to Great Kanawha river, Pt. Pleasant, W. Va., to Charleston, $331,000 (100). Place rip rap along the roadway slopes, Great Kanawha river, Pt. Pleasant, W. Va. to Charleston, $124,000 (0).

(Boston & Albany) *Fourth Track:* 0.04 miles, Athol Junction, Mass.

Grade Crossing Elimination: Overcrossings: Edward Park crossing, New York, $115,857 (60).

(Cleveland, Cincinnati, Chicago & St. Louis) *First Track:* 12.3 miles, Buckskin, Ind. to Dickeyville.

Grade Crossing Elimination: Overcrossings: Fairfield, Ohio, $153,750 (100). Elliston, Ind., $300,000 (100). Cincinnati, Ohio, $750,000 (50).

Subways: Track elevation to eliminate 6 crossings, Cincinnati, Ohio, $975,000 (100). Chrisman, Ill., $102,700 (100).

Reconstruction of Existing Grade Separation Structures: West Washington street, Indianapolis, Ind., $320,000 (100).

(Indiana Harbor Belt) Reconstruction of Existing Grade Separation Structures: Ashland avenue, Chicago, $200,000 (100), joint with Grand Trunk Western.

(Michigan Central) Overcrossings: U. S. Route 25, Vienna, Mich., $137,000 (100). Trenton, Mich., $725,000 (100).

Subways: Bonzano street, Ecorse, Mich., $510,000 (100). Inkster road, Inkster, Mich., $310,000 (100).

(Pittsburgh & Lake Erie) Relocation of Highways: Brady's Run, Fallston, Pa., $300,000 (100).

New York, Chicago & St. Louis

Grade Crossing Elimination: Overcrossings: Powell avenue, Esmer, Pa., $232,876 (65). Route 5, Bloomington, Ill., $66,000 (15). Route 132, Stallings, Ill., $103,000 (100).

Relocation of Highway: State Route 30, Valparaiso, Ind., $128,862 (75).

Important Work Undertaken: Replace steel viaduct, Conneaut, Ohio, $153,162 (10).

New York, New Haven & Hartford

Grade Crossing Elimination: Overcrossings: Eliot avenue, Borough of Queens, N. Y., $135,000 (100). Wilton, Conn., $135,000 (5). Stonington, Conn., $275,000 (15). Newington, Conn., $130,000 (5). Guilford, Conn., $140,000 (15). Moosup, Conn., $300,000 (100). Chelmsford, Mass., $100,000 (5).

Subways: Wickford Junction, R. I., $250,000 (100). Brewster, N. Y., $250,000 (20).

Reconstruction of Existing Grade Separation Structures: Cranston, R. I., $90,000 (100). Riverside, R. I., $45,000 (100). Mechanicsville, Conn., $125,000 (100). East Greenwich, R. I., $147,000 (5). South Bellingham, Mass., $100,000 (100).

Important Work Undertaken: Reconstruct bridge 14.48, Stonington, Conn., $172,000 (100). Reconstruct fender rack at Oak Point, New York, $119,000 (100). Construct brick freight house with second floor office and covered wood platform, New Haven, Conn., $237,000 (100).

Norfolk & Western

Second Track: 7.52 miles from Raitt, Va. to Weller Yard.

Grade Crossing Elimination: Overcrossings: Weller Yard, Va., $82,600 (100). Wytheville, Va., $650,000 (100).

Subways: St. Paul, Va., $93,790 (100). Norfolk, Va., $260,000 (100). Wirtz, Va., $52,040 (100). Batavia, Ohio, $215,020 (5). Antietam, Md., $161,000 (5).

Relocation of Highways: Oakvale, W. Va., to Ada, $12,000 (50). Nolan, W. Va., $32,700 (100). Rushtown, Ohio, $1,000 (100).

Important Work Undertaken: Double track steel viaduct, Maybeury, W. Va., $250,000 (100). Single track steel viaduct, Prilliman, Va., $80,000 (100). Construct storage tracks, extend passing siding and connect to distant control, Farm, W. Va., $250,000 (100). Flood defense work, Ironton, Ohio, $203,000 (25).

Norfolk Southern

Grade Crossing Elimination: Overcrossings: Grimesland, N. C., $50,000 (100). Wendell, N. C., $60,000 (100). South of Wilson, N. C., $53,000 (100).

Northern Pacific

Grade Crossing Elimination: Overcrossings: Cloquet, Minn., $98,000 (50). Ashland, Wis., $58,000 (100). Pompeys Pillar, Mont., $95,000 (100). Hewitt avenue, Everett, Wash. (100).

Subways: Fertile, Minn., $64,000 (100). Ninth street, Bismarck, N. D., $243,250 (70). Laurel, Mont., $85,000 (100). Harris street, Missoula, Mont., $296,000 (100). Spangler, Wash., $155,800 (100). Adco, Wash., $60,000 (100). Ritzville, Wash., $90,000 (100).

Important Work Undertaken: Grade raise and line change account construction of division dam across Missouri river by state, Lombard, Mont., $159,000 (60).

Panama

Important Work Undertaken: Installation of stone ballast, Colon to Panama, $192,000 (100).

Pennsylvania

Grade Crossing Elimination: Overcrossings: Ashburner street, Philadelphia, Pa. (100). Odenton, Md. (100). Rockville, N. Y. (2). U. S. Route 6, Hobart, Ind. (5). U. S. Route 131, Wayland, Mich. (100). U. S. Route 30-N, Crestline, Ohio (60).

Subways: Track elevation to eliminate five crossings and new passenger and freight stations, Woodbridge, N. J. (90). State Highway 55, Crown Point, Ind. (100). U. S. Route 30, Valparaiso, Ind. (10). Fife Lake, Mich. (75). Marble Cliff, Ohio (10).

Relocation of Highways: Folly Woods road and Walnut street, Newport, Del. (100). Cheverly, Md. (100). Greenbush, Va. (100). Cross Creek road, Cherlock, Pa. (100). The foregoing projects were constructed with the aid of federal funds at an approximate total cost of $3,046,124.

Important Work Undertaken: Replace inadequate highway bridge with a concrete and steel structure on an improved alinement, Penn's Neck road, Princeton Junction, N. J. (100). New restaurant bar and cocktail lounge and relocation of barber shop, Pennsylvania station, New York (100). Replace existing mail conveyors with modern conveyors, Pennsylvania station, New York (100). New coaling facility to replace coal trestle, Greenville, N. J. (100). Relocate tracks on account of municipal airport, Philadelphia, Pa. (82). Philadelphia Terminal improvements, Philadelphia, Pa. (89). Extension of Pier 5, Baltimore, Md. (100). Connection from Rockville bridge to Enola Yard, Rockville, Pa. (100). Reconstruction of overhead bridge, West Fairview, Pa. (100). Reconstruction of overhead bridge, Grazierville, Pa. (100). Reconstruction of undergrade bridge, Ontelaunee, Pa. (20). Reconstruction of 12-stall engine house destroyed by fire, with rearrangement of power plant, South Oil City, Pa. (100). Grading for improved alinement to eliminate reverse curve, Garfield, Ohio (2). Reconstruction of Chartiers avenue overhead bridge and rearrangement of station facilities, Corliss station, Pittsburgh, Pa. (30). Reconstruction of East Market Street overhead bridge, Akron, Ohio (100). Construction of 120-ton coal dumper, 3700 lin. ft. of dock and dock wall, 350-car yard and construction of 400 ft. channel 8000 ft. long, Sandusky, Ohio (100). Elevation of 2 main tracks in 14th street from the Ohio river bridge to Broadway and single track runoffs to Breckenridge street and to 15th street, requiring construction of subways at 10 streets. Also a single track elevated connection, located on a new right-of-way from Broadway to 11th and Maple streets. Centralized traffic control and improvement and extension of Portland avenue freight house and team track facilities, Louisville, Ky. (10). Construction of 1200-ton reinforced concrete coal wharf, including 100-ton sand storage, 2 water type ash pits, two washing platforms, water and drainage facilities and a revised track layout, Columbus, Ohio (50). Reconstruction of undercrossing, U. S. Route 50, Milford, Ohio (5). Approximate total cost of foregoing projects, $73,870,400.

(Long Island) Overcrossings: Construction of 4½ miles of two-track subway along Atlantic avenue, Brooklyn, N. Y., depressing tracks about 27 ft. to eliminate 20 grade crossings, includes construction of two new stations (1). Viaduct over Horse Block road, Medford, L. I. (100). Belt Parkway, Queens Village, L. I. (100).

Subways: Lynbrook, L. I. (100), track elevation to eliminate 7 grade crossings. Track elevation to eliminate 39 grade crossings, construction of 9 new stations and 4.6 miles of new highway, Rockaway Beach, L. I. (2). Track elevation of 1½ miles to eliminate 3 grade crossings, construction of one new station, Aqueduct, L. I. (15). Belt Parkway, Belmont Park, L. I. (85). Belt Parkway, Queens Village, L. I. (100). Belt Parkway, Douglaston, L. I. (100).

Reconstruction of Existing Grade Separation Structures: Liberty avenue, Hollis, L. I. (100).

Pennsylvania-Reading

Grade Crossing Elimination: Subways: Track elevation to eliminate 7 grade crossings, including relocation of 3.25 miles of double track, Absecon, N. J. (65).

Reconstruction of Existing Grade Separation Structures: State Route 51, Bridgeport, N. J. (70).

Pere Marquette

Grade Crossing Elimination: Overcrossings: Laraway road, Grand Rapids, Mich., $154,000 (100). Grand Blanc, Mich., $350,000 (40).

Pittsburg & Shawmut

Important Work Undertaken: Construction of Eddyville Industrial Spur, 4.56 miles of side tracks, Eddyville, Pa., $123,667 (100).

Reading

Grade Crossing Elimination: Overcrossings: Mt. Airy avenue, Philadelphia, Pa., $282,000 (100).

Subways: 22nd and Allegheny avenue, Philadelphia, Pa., $835,000 (99).

Important Work Undertaken: Construction of new brick passenger station at 22nd and Allegheny avenue, and brick concrete and steel framed freight station at 21st and Allegheny avenue in conjunction with elimination of grade crossings, Philadelphia, Pa., $98,000 (100).

St. Louis and O'Fallon

Grade Crossing Elimination: Overcrossings: 45th street and St. Clair avenue, East St. Louis, Ill., joint with Louisville & Nashville.

St. Louis-San Francisco

Grade Crossing Elimination: Overcrossings: Frisco City, Ala., $60,000 (100). Lafayette street, Fayetteville, Ark., $30,000 (100). U. S. Route 61, Yarbro, Ark., $130,000 (100). West Lancaster avenue, Ft. Worth, Tex., $557,467 (100). U. S. Route 65, Springfield, Mo., $275,000 (100). Seventh street, Joplin, Mo., $354,893 (75). U. S. Route 160, Lamar, Mo., $90,000 (100). State Highway 5, Kimbrough, Ala., $15,100 (75).

Subways: 5th avenue, north, Birmingham, Ala., $94,000 (100). East 3rd avenue, Durant, Okla., $60,000 (100).

Relocation of Highways: U. S. Route 63, Gilmore, Ark., to Turrell, $140,000 (100). U. S. Route 70, Bennington, Okla. to Bokchito, $75,000 (100). State Highway 14, Gunter, Tex., $17,000 (100). State Highway 14, Gunter, Tex., $51,000 (100).

Reconstruction of Existing Grade Separation Structures: East 23rd street, Oklahoma City, Okla., $80,260 (100).

St. Louis Southwestern

First Track: Lufkin Junction, Tex., 1.88 miles.

Grade Crossing Elimination: Subways: Glenwood boulevard, Tyler, Tex., $75,000 (100). Texarkana, Ark., $100,000 (10). Buckner, Ark., $35,000 (20).

Relocation of Highways: Redwater, Tex. to Maud, $120,000 (100).

Important Work Undertaken: Extend erecting and machine shop, install 15 ton and 50 ton crane and 250 ton locomotive lift, Pine Bluff, Ark., $110,000 (100).

San Diego & Arizona Eastern

Grade Crossing Elimination: Overcrossings: State Highway 12, La Mesa, Cal., $25,100 (100).

Savannah & Atlanta

Grade Crossing Elimination: Subways: Jefferson County, Ga., $50,000 (45).

Important Work Undertaken: Revision of alinement and grade, mile post 96 to mile post 111, $225,000 (80). Revision of alinement and grade, mile post 58 to mile post 64, $175,000 (75).

Seaboard Air Line

Grade Crossing Elimination: Overcrossings: Bowers Hill, Va. (100). Kollocks, S. C. (100). Georgetown, S. C. (100). Neeces, S. C. (100). Everett, Ga. (100). Wattsville, Ala. (100).

Subways: Hamlet, N. C. (100). Apex, N. C. (80). Park avenue, Columbia, S. C. (100). Abbeville, S. C. (35). Central Junction, Savannah, Ga. (100). 5th avenue, Birmingham, Ala. (100). Irondale, Ala. (100).

Reconstruction of Existing Grade Separation Structures: Tryon street, Charlotte, N. C. (100). Old Hundred, N. C. (100). Johnson road, Atlanta, Ga. (100).

Southern

Grade Crossing Elimination: Overcrossings: Faber, Va., $20,000 (100). Amelia, Va., $44,180 (100). Mocksville, N. C., $60,000 (100). King's Mountain, N. C., $95,000 (100). Winston-Salem, N. C., $50,000 (100). Between Sylva, N. C. and Dillsboro, $125,000 (100). Lowell, N. C., $50,000 (10). Easley, S. C., $102,000 (100). Jonesville, S. C., $48,000 (100). Prosperity, S. C., $40,000 (100). Converse, S. C., $54,000 (100). Toccoa, Ga., $57,000 (100). Mayday, Ga., $40,000 (100). Surrency, Ga., $50,000 (5). Hiram, Ga., $30,000 (5). Pell City, Ala., $7,000 (100).

Subways: Clarksville, Va., $42,331 (80). Glen Raven, N. C., $116,000 (100). Brantley avenue, Kannapolis, N. C., $130,000 (100). Aycock School, Kannapolis, N. C., $94,000 (100). Patterson avenue, Winston-Salem, N. C., $50,000 (95). Blossom street, Columbia, S. C., $100,000 (95). 55th street and Grand avenue, Birmingham, Ala., $100,000 (98). Irondale, Ala., $49,500 (60). Catherine, Ala., $15,000 (5). Coster, Tenn., $65,000 (100). Bearden, Tenn., $160,000 (75). Jeffersontown, Ky., $70,000 (3).

Relocation of Highways: Ivy-Marshall, N. C., $200,000 (100). Near Everette, Ga., $70,000 (100). Clark Station, Ky. to Fisherville, $36,000 (100).

(Alabama Great Southern) Subways: 55th street and Grand avenue, Birmingham, Ala., $200,000 (98). Irondale, Ala., $46,000 (60).

(Cincinnati, New Orleans & Texas Pacific) Relocation of Highways: Science Hill, Ky., $47,000 (100).

(St. Johns River Terminal) Subways: Jacksonville, Fla., $81,000 (100).

(New Orleans & Northeastern) Subways: Poplarville, Miss., $65,800 (70).

Southern Pacific

First Track: Connection to Los Angeles Union Passenger Terminal, Los Angeles, Cal., 0.18 mile. Coram, Cal. to Kennet, 0.67 mile. New line under construction, Redding, Cal. to Delta, 30.09 miles.

Second Track: Connection to Los Angeles Union Passenger Terminal, Los Angeles, Cal., 0.18 mile.

Third Track: West Oakland, Cal. to 16th street, Oakland, 0.72 mile.

Fourth Track: West Oakland, Cal., to 16th street, Oakland, 0.38 mile.

Grade Crossing Elimination: Overcrossings: Solamint, Cal., $46,870 (100). Daly street, Los Angeles, Cal., $37,238 (100). University avenue, Berkeley, Cal., $330,220 (100). Pomona, Cal., $145,238 (90). Turlock, Cal., $329,951 (87). Deeth, Nev., $16,393 (100). Rose Creek, Nev., $109,707 (100). Albany, Ore., $230,270 (95). Lobert, Ore., $85,000 (100).

Subways: Lankershim boulevard, Los Angeles, Cal., $212,760 (100).

Planehaven, Cal., $102,035 (100). Redding, Cal., $214,897 (100). Palm Springs, Cal., $79,990 (100). Klamath Falls, Ore., $88,231 (100). Central avenue, Phoenix, Ariz., $274,650 (78). Luzena, Ariz., $70,000 (20).

Important Work Undertaken: Reconstruction of facilities at various points to accommodate heavier power, including longer turntables, longer engine pits and additional oil and water facilities, $273,000 (100). Construction of concrete sea wall to prevent erosion by ocean along Coast line, San Francisco, Cal. to Los Angeles, and repairs to walls previously constructed, $194,000 (95). Installation of two 200-ft. single track through plate girders over Los Angeles river to replace three-span bridge demolished in 1938 flood, Los Angeles, Cal., $285,000 (100). Lengthening passing sidings, Rawson, Cal., Red Bluff, Blunt and Cottonwood, and Frazier, Ore., Pryor, Carter and Natron, $129,000 (50).

(Lines in Texas and Louisiana) Overcrossings: Nacogdoches, Tex., $204,000 (85). Columbus, Tex., $213,900 (100). Kelly Field, Tex., $194,000 (55). Avondale, La., $140,000 (2).

Subways: Jensen drive, Houston, Tex., $145,000 (5). Elam, Tex., $65,390 (100). Weimar, Tex., $79,084 (100). McKinney, Tex., $70,000 (100). Marlin, Tex., $80,000 (100). Normanna, Tex., $145,000 (2). Burton, Tex., $85,000 (0). Flatonia, Tex., $100,000 (0).

Relocation of Highways: Sabinal, Tex., $301,000 (100). Sunset, La., $250,000 (0). Giddings, Tex., $82,000 (0). Mexia, Tex., $94,000 (0).

Important Work Undertaken: Renewal of Neches River bridge, Beaumont, Tex., $390,000 (5).

Spokane, Portland & Seattle

Grade Crossing Elimination: Subways: Third street, Bend, Ore., (100).

Important Work Undertaken: 500,000-bu. reinforced concrete addition to grain elevator, Vancouver, Wash., $100,000 (100).

Tennessee Central

Grade Crossing Elimination: Reconstruction of Existing Grade Separation Structures: Nashville, Tenn., $35,000 (50).

Texas and Pacific

Grade Crossing Elimination: Overcrossings: Lobdell, La., $193,000 (20). Near Mansfield, La., $65,000 (10). Near Avondale, La., $300,000 (5). Near Sherman, Tex., $3,000 (100).

Subways: St. Patrick street, Donaldsonville, La., $65,000 (100). Baird, Tex., $114,000 (50). Handley, Tex., $110,000 (10). Fifth street, Longview, Tex., $272,000 (40).

Important Work Undertaken: Construct brick passenger station, subway and train shed, Longview, Tex., $175,000 (75). Remodel present passenger station, construct passenger subway and train shed, Marshall, Tex., $150,000 (50).

Texas City Terminal

Important Work Undertaken: Construct 550-ft. quay type wharf, steel sheet piling face, small amount of dredging for extension and deepening slip, 5 yard tracks totaling 5000 ft. to serve the wharf, Texas City, Tex., $150,000 (80).

Toledo, Angola & Western

Grade Crossing Elimination: Subways: Toledo, Ohio, $200,000 (90).

Union

Grade Crossing Elimination: Subways: Willett St., Memphis, Tenn., $292,500 (100).

Union Pacific

First Track: Nevens, Neb. to Lewellen, 33.14 miles. Pasadena Junction, Cal. to Alhambra Junction, 0.18 mile.

Grade Crossing Elimination: Overcrossings: Olive street, Salina, Kan., $137,000 (100). Rose Lake, Idaho, $160,400 (100). N. E. 42nd avenue, Portland, Ore., $42,000 (100). Meridian street, Puyallup, Wash., $95,000 (100). U. S. Route 195, Pullman, Wash., $254,000 (100). Kansas City, Kan., $381,400 (100). U. S. Route 191, Sugar City, Idaho, $41,500 (100). State Route 95, Glendale, Idaho, $46,900 (100).

Subways: Los Angeles, Cal., $197,700 (60).

Important Work Undertaken: Construct two steel truss spans on concrete piers and abutments and two I-beam spans on reinforced concrete and steel pile piers and abutments, replacing two 80-ft. TPG spans, Baxter, Cal., $231,500 (100). Construct two steel truss spans on concrete piers and abutments and two I-beam spans on concrete and steel pile pier and abutments, Afton, Cal., $207,500 (100). Construct two steel truss spans on concrete piers and abutment and one span on reinforced concrete and steel pile abutment, Afton, Cal., $260,000 (100). Construction of steel bridge, Yermo, Cal., $185,300 (100). Install three escalators with necessary equipment with enclosures serving tracks 1 to 5 inclusive, Union Passenger station, Omaha, Neb., $116,000 (100). Purchase additional property north of Carter Lake and construct trackage for industrial district, Omaha, Neb., $420,000 (100). Construct new stock yard facilities, Valley, Neb., $116,000 (100). Construct trackage and roadways for team and yard tracks in connection with perishable food terminal, Kansas City, Kan., $559,000 (70). Rearrange and construct additional trackage for classification of perishables in connection with operation of food and perishable market, Kansas City, Kan., $260,000 (100). Construct two mass concrete piers on steel foundation piles and two reinforced concrete pile abutments under three lattice truss spans, Manhattan, Kan., $112,000 (50). Purchase of land and construction of trackage and buildings, paving, etc., for Denver Food Terminal Market, Denver, Colo., $1,200,000 (95). Construct 2-story air-conditioned passenger station with platforms, driveways, drainage sewer and water, Las Vegas, Nev., $115,000 (100).

Virginian

First Track: Cub City, W. Va. to Cub Creek, 0.42 mile. East of Oceana, W. Va. on Lower Road Branch, 0.62 miles.

Grade Crossing Elimination: Overcrossings: Surveyor, W. Va., $31,050 (100).

Important Work Undertaken: Alterations and improvements to coal pier No. 1, Sewalls Point, Va., $350,000 (100).

Wabash

Grade Crossing Elimination: Overcrossings: Springfield, Ill., $145,000 (100). Mitchell, Ill., $75,000 (100). Monticello, Ill., $100,000 (5).

Subways: Blakeslee, Ohio, $75,000 (100). Damen avenue, Chicago, $565,000 (80). 79th and Kedzie avenue, Chicago, $800,000 (5).

Reconstruction of Existing Grade Crossing Structures: Maryville, Mo., $50,000 (25).

Western Maryland

Grade Crossing Elimination: Overcrossings: Glen Morris, Md., $220,000 (100). Hancock, Md., $60,000 (100).

Subways: Hagerstown, Md., $185,000 (100).

Important Work Undertaken: Strengthening 22 bridges, between Williamsport, Md. and Cumberland, $250,000 (100).

Western Pacific

Grade Crossing Elimination: Overcrossings: Greenville, Cal., $120,000 (100). Oroville, Cal., $30,000 (100).

Railway Construction in Canada

Canadian National

First Track: Track rearrangement, Prince Albert, Sask., 0.91 miles.

Second Track: Moncton, New Brunswick, to Harcourt subdivision, 2.05 miles.

Grade Crossing Elimination: Overcrossings: Central avenue, Prince Albert, Sask. (100).

Subways: Stoney Creek, Ont. (100). St. Anne, Laframboise and Bourdages streets, St. Hyacinthe, Que. Notre Dame street, Montreal, Que. (100). St. Marquerite street, Montreal, Que. (100). 18th street, New Toronto, Ont. (100). Victoria Park avenue, Danfort, Ont. (100).

Reconstruction of Existing Grade Separation Structures: D'Argenson street, Montreal, Que. (100).

Important Work Undertaken: Construction of additional sidings, lengthening existing sidings, Pacific Junction, N. B., to Halifax. Yard extension, Turcot, Que. Repairs to and modernization of 4 stationary boilers in powerhouse, Transcona, Man. New passenger station, Saskatoon, Sask. New boiler house, steam generating plant and pipe tunnel, Saskatoon, Sask. Reconstruction of trestle, Sundance Creek Crossing, Alta. (100). New terminal facilities, Montreal, Que.

Canadian Pacific

Important Work Undertaken: Extending embankments, raising sags and applying new stone ballast, 53 miles of double track, Ignace subdivision, $900,000 (100). Widening embankments and applying new gravel ballast, Indian Head Subdivision, $80,000 (100).

Grand River

Second Track: East Preston, Ont., to Preston Junction, 1.06 miles.

Pacific Great Eastern

Important Work Undertaken: Bridge over Quesnel river, mile 346.5 (to be completed October, 1940).

Quebec Central

Grade Crossing Elimination: Subways: Diversion of both railway and highway to permit construction of subway, Route 1, Ascot, P. Q., $36,919 (100).

Toronto, Hamilton & Buffalo

Grade Crossing Elimination: Reconstruction of Existing Grade Separation Structures: Dundurn street, Hamilton, Ont., $100,000 (90).

Railway Construction in Mexico

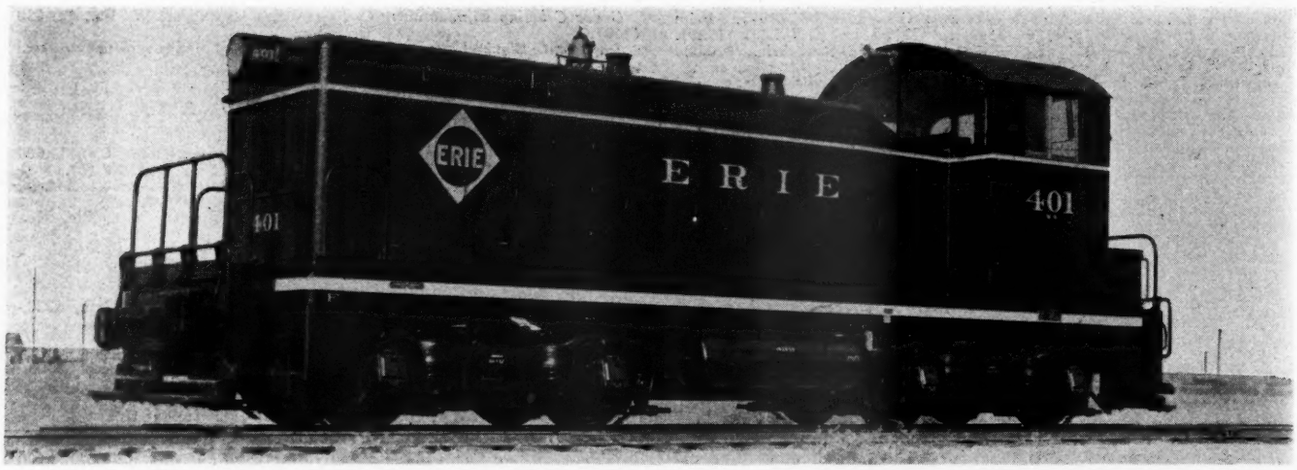
National of Mexico

Important Work Undertaken: New station and station grounds, San Luis Potosi, S.L.P., $207,000 (35). Three-span bridge over Grand Canal, Federal District, $50,000 (95).

New Line Construction in Mexico

Fuentes-Brotantes-Punta Penasco, 172 km. (Completed). Puerto, Mexico, to Campeche, 780 km., grading completed for 320 km., 174 km. of track laid. Calzontzin to Apatzingan to Zihuatanego, $18,339,077, grading completed, 5 bridges completed, 79 km. of track laid. Ixcaquixtla to Chachahua, 192 miles (under construction).

New Lines Projected: La Junta to Creel and from San Pedro to Topoiobanpo, 200 km., 28,000,000 pesos. Reforma to Arriga, 100 km. Barra de Piche to Iron Ore deposits of Las Truchas.



Locomotives Ordered in 1939

Total of 375 is 64 per cent greater than 1938's volume; export and Canadian orders show sharp rise

By William H. Schmidt

Associate Editor

THE total of 375 locomotives ordered during 1939 in the United States for domestic service is 64 per cent in excess of the total ordered in 1938 and almost 2 per cent (1.9) greater than 1937's purchases. Furthermore, it is more than twice the volume ordered in any of the depression years since 1930, with the exception of 1936.

Although locomotive builders and shops shared in the upswing in buying which started concurrently with rapidly mounting carloadings in September, it is to be noted that each half of the year accounted for about 50 per cent of the volume ordered, which fact may indicate an early anticipation of motive power needs by the carriers.

The 1939 total is made up of 95 steam locomotives, 32 electric and 248 Diesel-electric and other internal combustion types. Orders in 1938 comprised 36 steam, 29 electric and 163 Diesel and gasoline powered locomotives. As has been the rule in these columns since 1936, locomotives for "streamliners" which are non-revenue power units exclusively are listed and included in the locomotive totals; power *cars* are tabulated as rail-motor cars and appear under "passenger-train cars".

The Southern Pacific purchased the largest number of locomotives during the year,—namely, 40 steam and 10 Diesel-electric units. The Atchison, Topeka & Santa Fe was second in line with total orders for 31 Diesel-electrics. Largest order for straight electric power was placed by the Pennsylvania for 20 units.

Foreign roads placed orders during the year with American builders for a total of 40 locomotives—36 steam and 4 Diesel-electric. This total is almost twice that purchased in 1938 and exceeds that of any year since 1929, with the exception of 1937.

Canadian builders and shops booked orders during 1939 for a total of 56 locomotives, all steam, which is 60 per cent in excess of 1938 Canadian commitments, substantially in excess of total orders for all of the years 1931 to 1936, inclusive, and lacking just one unit of the record for 1937.

Locomotives *built* during the year for domestic service in the United States as distinguished from those *ordered,* totaled 338, of which 83 were steam, 21 electric and 234 Diesel-electric and others. This total constitutes a 24 per cent improvement over the 1938 production figure of 272 locomotives (132 steam, 37 electric and 103 Diesel-electric and others) and exceeds that of any year since 1930, with the exception of 1937. Locomotives built for export totaled 16—eight steam, four electric and four Diesel-electric—as compared with a total of 28 for 1938. Canadian builders turned out a single

Table I—Locomotive Orders in 1939

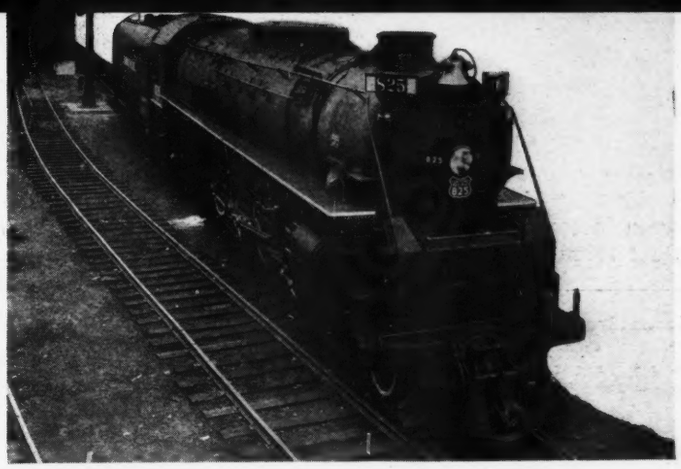
For service in the United States	375
For export from the United States	40
For service in Canada and exports from Canada	56
Grand total	471

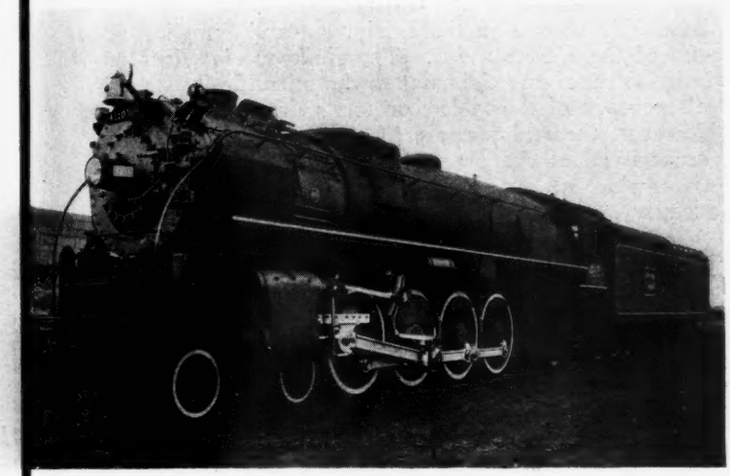
Table II—Orders for Locomotives 1929-1939

Year	Domestic	U. S. Export	Canadian		Total
1929	1,212	106	77		1,395
1930	440	20	95		555
1931	176	28	2		206
1932	12	1	1	(Export)	14
1933	42	7	..		49
1934	183	17	..		200
1935	87*	15	27		129*
1936	533	22	1		556
1937	368	56	57	(Inc. Export)	481
1938	228	24	35		287
1939	375	40	56		471

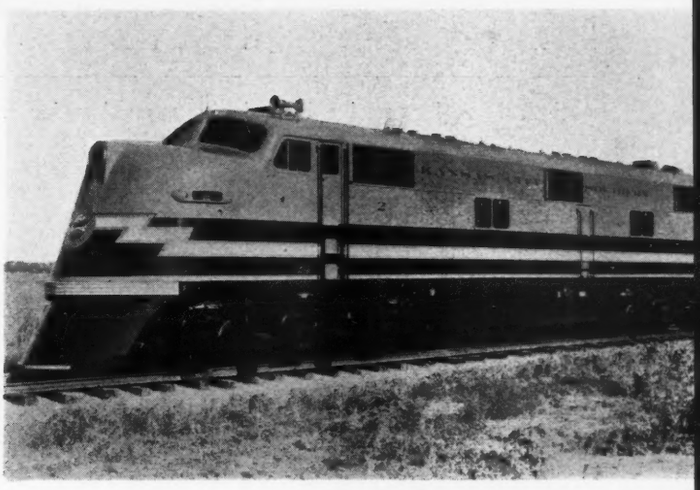
* Revised to include locomotives for articulated or partially articulated trains.

Fifteen Passenger Locomotives of this Type Were Built for the Union Pacific by the American Locomotive Company. The Tractive Force is 63,800 Lb.

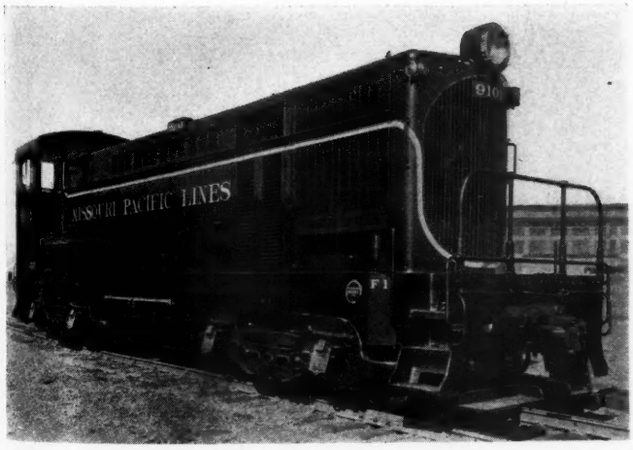




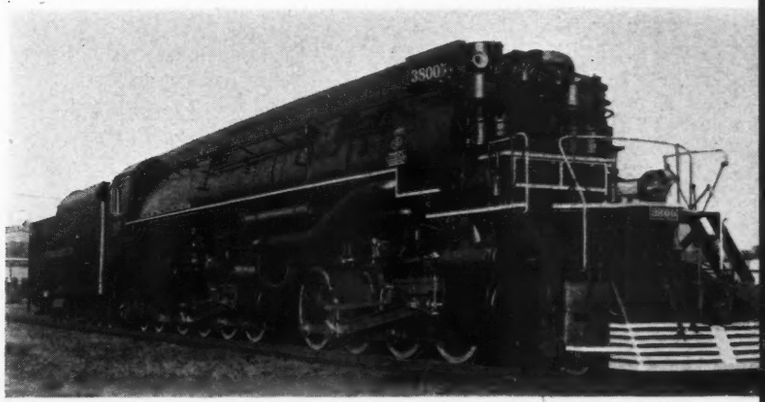
One of Three 4-8-2 Type Freight Locomotives Built for the Boston & Maine by the Baldwin Locomotive Works. Tractive Force 67,000 Lb.



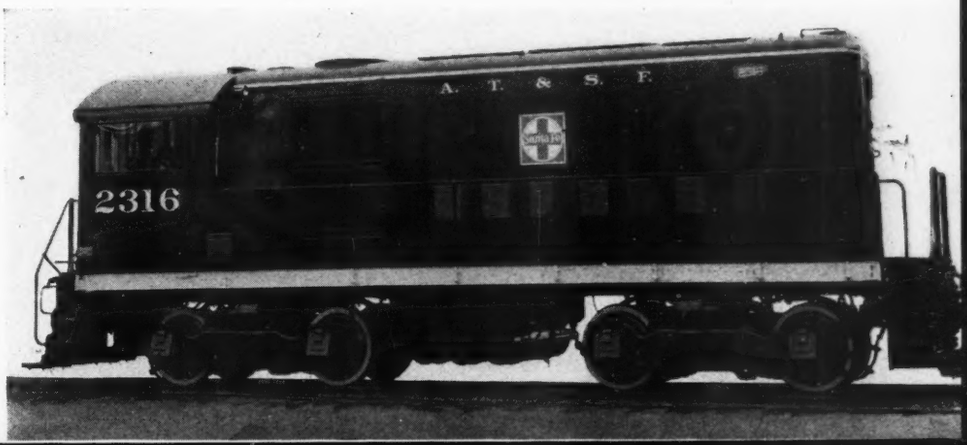
Diesel-Electric 2,000-Hp. Passenger Locomotive for Service on the Kansas City Southern. Built by the Electro-Motive Corporation



Baldwin Diesel-Electric Switching Locomotive for the Missouri-Pacific. De La Vergne 1,000-Hp. Diesel Engine and Westinghouse Electrical Equipment



One of Twelve 2-8-8-4 Type Passenger-Freight Locomotives Built for the Southern Pacific by Lima Locomotive Works. Tractive Force 124,300 Lb.



1,000-Hp. Turbo-Charged Diesel-Electric Switcher for Operation on the A. T. & S. F. Built by the American Locomotive Company. General Electric electrical equipment

steam locomotive during the year, as compared with 46 in 1938.

The distinction between locomotives ordered and the number built is important to an understanding of these statistics. A locomotive is under construction for several months and thus locomotive production figures for any year naturally includes some units which were ordered during the closing months of the year previous to that under review. It is this overlap from year to year that results in a total production figure different from the total ordered.

Table III—Locomotives Built 1929-1939

Year	Domestic	U. S. Export	Canadian	Total
1929	926	139	96	1,161
1930	972	51	111	1,134
1931	181	17	24	222
1932	102	18	3 (Inc. Export)	123
1933	57	6	..	63
1934	91	19	..	110
1935	184	17	4	205
1936	157	22	23	202
1937	526	44	45 (Inc. Export)	615
1938	272	28	46	346
1939	338	16	1	355

The Car Service Division of the Association of American Railroads reports semi-annual totals of locomotive installations and retirements. These figures do not agree with the *Railway Age* totals of locomotives ordered or built, because the Car Service Division total covers only Class I carriers, whereas the *Railway Age* figures cover all carriers, and also industrial users.

The details in the appended list of locomotive orders were supplied by railways and other purchasers in response to inquiries from the *Railway Age*. They were checked against similar lists furnished through the cooperation of the builders, and amplified by reference to the weekly reports in the Equipment and Supplies column of the *Railway Age*. The *Railway Age* does not desire to make any claims as to the scientifically statistical accuracy of the tables, or totals drawn from them. However, the real purpose of the statistics is to allow comparisons of the year's business with that of other years, which purpose it is believed they serve with entire adequacy.

Steam Locomotive Orders in 1939

For Service in the United States

Purchaser	No.	Type	Service	Weight	Tractive force	Cylinders	Date of order	Date of delivery	Builder
Aliquippa & Southern	2	0-8-0	Sw.	231,000	59,900	25 x 28	October	December	American
Boston & Maine	3	4-8-2	Freight	418,100	67,000	28 x 31	September	Jan. '40	Baldwin
Chicago, Burlington & Quincy	10	4-8-4	Freight	473,800	67,500	28 x 30	October	1940	Company Shops
Chicago, Rock Island & Pacific	11*	Tenders	.....	.....	.....	.....	March	.....	American
Detroit, Toledo & Ironton	2	2-8-4	Freight	411,500	65,780	25 x 30	September	Jan. '40	Lima
Green Bay & Western	3	2-8-2	Freight	285,000	47,250	22 x 30	June	Oct.-Nov.	American
Lehigh Valley	3*	Tenders	.....	.....	.....	.....	May	1939	American
Norfolk & Western	10	2-8-8-2	Freight	582,900	126,838	25 & 39 x 32 (4 cyl.)	September	Jan.-Dec. '40	Company Shops
Panama	5	2-6-0	.....	170,000	.....	18 x 26	December	1940	American
Pennsylvania	25*	Tenders	.....	.....	.....	.....	May	December	Company Shops
St. Louis-San Francisco	5	4-8-2	Freight	419,200	77,350	29 x 32	October	July '40	Company Shops
Southern Pacific	28	4-8-8-2	Frt. & Pass.	657,900	124,300	24 x 32 (4 cyl.)	February	July-Oct.	Baldwin
	12	2-8-8-4	Frt. & Pass.	689,900	124,300	24 x 32 (4 cyl.)	February	November	Lima
Union Pacific	15	4-8-4	Pass.	480,000	.....	25 x 32	March	1939	American

United States—Export

Purchaser	No.	Type	Service	Weight	Tractive force	Cylinders	Date of order	Date of delivery	Builder
Central Ry. of Brazil	7	2-10-4	.....	248,000	.....	20 x 24	October	1940	American
	10	2-10-4	Freight	248,000	41,100	20 x 24	October	1940	Baldwin
Chilean State Railways	5	4-8-2	Frt. & Pass.	237,500	37,500	22½ x 28	November	1940	Baldwin
	6	2-8-2	Frt. & Pass.	144,000	27,900	19½ x 22	November	1940	Baldwin
E. de F. Sorocabana (Brazil)	4	4-10-2	.....	246,000	.....	17½ x 24 & 22 (3 cyl.)	October	1940	American
F. C. de Antioquia (Colombia)	2	2-8-2	Frt. & Pass.	134,900	26,400	17 x 22	January	June	Baldwin
Guayaquil & Quito (Equador)	2	2-8-0	Freight	145,700	32,150	19 x 22	March	July	Baldwin

Canada

Purchaser	No.	Type	Service	Weight	Tractive force	Cylinders	Date of order	Date of delivery	Builder
Canadian National	15	4-8-4	Freight	403,600	66,800†	25½ x 30	October	1940	Montreal
	10	4-8-4	Freight	391,600	56,800	25½ x 30	October	April-May '40	Canadian
Canadian Pacific	12	4-6-2	Frt. & Pass.	321,000	45,250	22 x 30	October	Jan.-Mar. '40	Canadian
	12	2-8-2	Freight	336,000	57,500	22 x 32	October	Apr.-June '40	Montreal
	5	4-6-4	Pass.	364,000	57,250†	22 x 30	October	Mar. '40	Montreal
Dominion Steel & Coal Corp.	1	0-4-0	.....	75,000	.....	14 x 22	1939	1939	Montreal
Roberval & Saguenay	1	2-8-0	Freight	231,400	47,300	23 x 30	November	Feb. '40	Canadian

* Not included in totals.
† Tractive force including booster.

Electric Locomotives

For Service in the United States

Purchaser	No.	Wheel arrangement	Service	Weight	Horsepower	Date of order	Date of delivery	Builder Electrical Equipment—Locomotive
Nevada Cons. Copper Corp.	7	B-B	Freight	170,000	970	August	Feb.-Mar. '40	General Electric
Pennsylvania	20	2-C+C-2	Pass.	460,000	4,620	September	Mar. '40	West.-G. E. Co. Sh.
Tennessee Coal, Ir. & R. R. Co.	1	B-B	.....	45,365	300	March	June	West.-Baldwin
	3	B-B	.....	45,365	300	September	.....	West.-Baldwin
Woodward Iron Co.	1	B-B	.....	20,250	100	March	June	West.-Baldwin

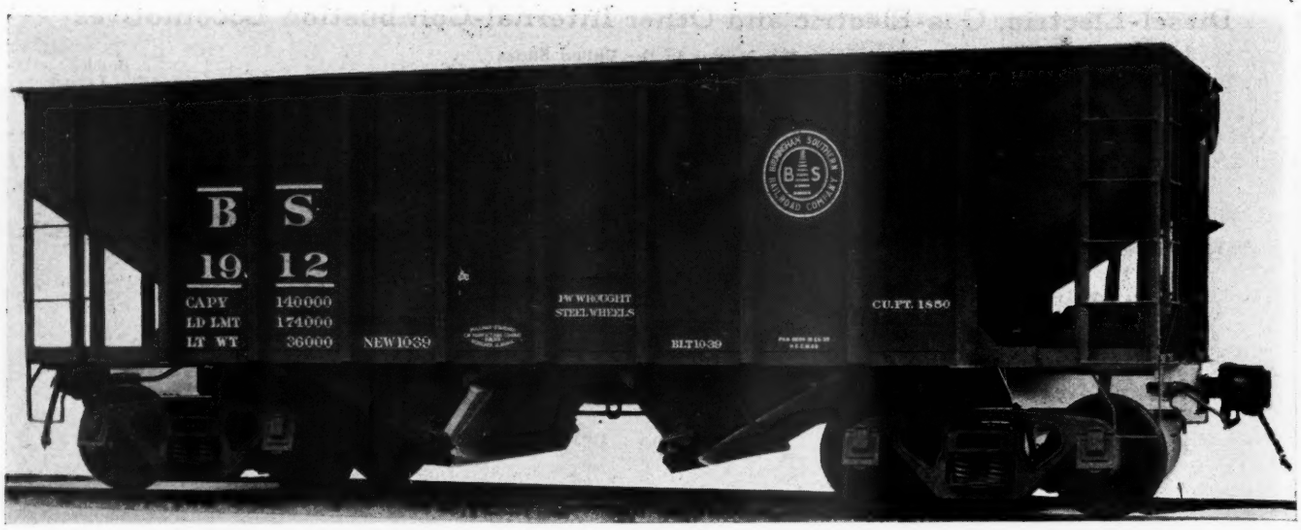
Diesel-Electric, Gas-Electric and Other Internal-Combustion Locomotives

For Service in the United States

Purchaser	No.	Wheel arrangement	Service	Type	Weight	Horsepower	Date of order	Date of delivery	Builder Electrical Equipment-Locomotive Builder-Engine Builder
American Metal Co., Ltd. ...	1	B	Sw.	Diesel-Elec.	90,000	340	January	May '40	G. E.-Cooper-Bessemer
Atchison, Topeka & Santa Fe.	12	B-B	Sw.	Diesel-Elec.	230,000	1,000	May	September	G. E.-American
	13	B-B	Sw.	Diesel-Elec.	250,000	1,000	May	September	Electro-Motive
	1	2(B-B)	Pass.	Diesel-Elec.	604,000	4,000	June	September	Electro-Motive
	5	B-B	Sw.	Diesel-Elec.	240,000	1,000	June	.....	West.-Baldwin
Atlantic Coast Line	2	C-C	Pass.	Diesel-Elec.	299,000	2,000	June	November	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	200,000	600	September	October	Electro-Motive
Birmingham Southern	3	B-B	Sw.	Diesel-Elec.	250,000	1,000	August	August	West.-American
Boston & Maine	3	B-B	Sw.	Diesel-Elec.	200,000	600	October	November	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	200,000	660	October	1939	G. E.-American
Broward County Port Authority	2	B-B	Sw.	Diesel-Elec.	86,000	300	February	April	G. E.-Cummins
Buffalo Creek	2	B-B	Sw.	Diesel-Elec.	201,400	600	January	January	Electro-Motive
Central of Georgia	1	B-B	Sw.	Diesel-Elec.	203,600	600	October	October	Electro-Motive
Chicago & North Western ...	1	B-B	Sw.	Diesel-Elec.	206,060	600	Dec. '38	January	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	253,940	900	Dec. '38	January	Electro-Motive
	2	2(C-C)	Pass.	Diesel-Elec.	415,600	4,000	January	June	Electro-Motive
Chicago, Burlington & Quincy	5	B-B	Sw.	Diesel-Elec.	200,000	600	June	June	Electro-Motive
	1	C-C	Pass.	Diesel-Elec.	308,000	2,000	December	1940	Electro-Motive
	3	2(C-C)	Pass.	Diesel-Elec.	.....	4,000	1939	1940	Electro Motive
Chicago, Milw., St. P. & Pac.	2	B-B	Sw.	Diesel-Elec.	250,000	1,000	April	May	Electro Motive
	2	B-B	Sw.	Diesel-Elec.	200,000	600	April	May	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	200,000	600	August	August	Electro-Motive
	2	B-B	Sw.	Diesel-Elec.	199,000	600	April	April	West.-American
Chicago, Rock Island & Pacific	1	B-B	Sw.	Diesel-Elec.	88,000	360	March	July	West.-Dav. B.-Cater
	2	C-C	Pass.	Diesel-Elec.	308,000	2,000	March	July	Electro-Motive
	5	B-B	Sw.	Diesel-Elec.	88,000	360	October	.....	West.-Dav. B.-Cater
	5	B-B	Sw.	Diesel-Elec.	88,000	360	October	.....	West.-Baldwin-Cater
	1	....	Pass.	Diesel-Elec.	.....	2,000	1939	1939	American
Elgin, Joliet & Eastern	5	B-B	Sw.	Diesel-Elec.	198,000	600	November	Jan. '40	Electro-Motive
	3	....	Sw.	Diesel-Elec.	198,000	660	November	Jan. '40	American
Erie	4	B-B	Sw.	Diesel-Elec.	198,500	660	September	October	G. E.-American
	3	B-B	Sw.	Diesel-Elec.	247,100	1,000	September	Oct.-Dec.	Electro-Motive
Florida East Coast	2	C-C	Pass.	Diesel-Elec.	308,000	2,000	July	December	Electro-Motive
Ford Motor Co.	3	B-B	Sw.	Diesel-Elec.	260,000	1,000	February	June	G. E.-Cooper Bess.
Ft. Worth & Denver City ...	1	B-B	Sw.	Diesel-Elec.	200,000	600	December	December	Electro-Motive
Great Northern	12	B-B	Sw.	Diesel-Elec.	247,400	1,000	May	August	Electro-Motive
	2	B-B	Rd. & Sw.	Diesel-Elec.	247,400	1,000	May	.....	Electro-Motive
Griffith Co. & Bent Co. (Calif.)	1	B-B	Sw.	Diesel-Elec.	86,000	300	October	1940	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	140,000	400	October	1940	G. E.-Cummins
Illinois Central	7	B-B	Sw.	Diesel-Elec.	191,000	600	October	Nov.-Dec.	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	243,000	1,000	October	December	Electro-Motive
	2	2(B-B)	Tr.	Diesel-Elec.	486,000	2,000	October	Jan. '40	Electro-Motive
Inland Steel Co.	1	....	.....	Diesel-Elec.	.....	660	December	1939	West.-American
	1	B-B	Sw.	Diesel-Elec.	200,000	600	December	December	Electro-Motive
International Great Northern..	4	B-B	Sw.	Diesel-Elec.	200,000	600	November	Dec.-Jan. '40	Electro-Motive
Kansas City Southern	2	C-C	Pass.	Diesel-Elec.	293,000	2,000	1939	Apr.-Aug.	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	250,000	1,000	May	June	Electro-Motive
Lehigh Portland Cement	1	B	Sw.	Diesel-Elec.	46,000	150	August	September	G. E.-Cummins
Lehigh Valley	1	B-B	Sw.	Diesel-Elec.	200,000	600	January	April	Electro-Motive
Louisville & Nashville	1	B-B	Sw.	Diesel-Elec.	201,800	600	September	September	West.-American
	1	B-B	Sw.	Diesel-Elec.	203,400	600	September	September	Electro-Motive
Maine Central	2	B-B	Sw.	Diesel-Elec.	200,000	660	August	September	G. E.-American
Minneapolis & St. Louis	1	B-B	Sw.	Diesel-Elec.	234,000	1,000	March	May	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	230,000	1,000	June	June	West.-American
	1	B-B	Sw.	Diesel-Elec.	197,500	660	September	September	G. E.-American
Minn. St. P. & S. Ste. Marie	2	B-B	Sw.	Diesel-Elec.	250,000	1,000	September	October	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	200,000	600	September	October	Electro-Motive
Minnesota Transfer	3	....	Sw.	Diesel-Elec.	.....	900	1939	1939	American
Missouri Pacific	2	B-B	Rd.	Diesel-Elec.	199,100	900	April	May	G. E.-Electro-Motive
	2	B-B	Sw.	Diesel-Elec.	203,860	600	April	September	Electro-Motive
	1	C-C	Pass.	Diesel-Elec.	292,900	2,000	April	October	G. E.-Electro-Motive
	1	C-C	Pass.	Diesel-Elec.	294,730	2,000	April	October	West.-Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	250,620	1,000	April	September	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	230,140	1,000	April	September	West.-American
	1	B-B	Sw.	Diesel-Elec.	243,420	1,000	April	November	West.-Baldwin
Monongahela Connecting	2	B-B	Sw.	Diesel-Elec.	256,000	1,100	June	December	G. E.-Cooper-Bess.
	2	B-B	Sw.	Diesel-Elec.	256,000	1,500	June	Jan. '40	G. E.-Cooper-Bess.
Newburgh & South Shore ...	1	B-B	Sw.	Diesel-Elec.	230,000	1,000	November	November	West.-American
New York Central System ...	3	B-B	Sw.	Diesel-Elec.	220,000	600	March	May	Electro Motive
	2	B-B	Sw.	Diesel-Elec.	220,000	600	March	May	G. E.-American
	5	B-B	Sw.	Diesel-Elec.	220,000	600	November	December	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	140,000	400	November	Feb. '40	G. E.-Diesel RR E.-C.
N. Y., New Haven & Hartford	10	B-B	Sw.	Diesel-Elec.	195,000	660	October	Nov.-Dec.	G. E.-American
Northeast Oklahoma	1	B-B	Frt. & Sw.	Diesel-Elec.	160,000	500	April	April	G. E.-Cummins
	1	B-B	Frt. & Sw.	Diesel-Elec.	160,000	500	November	November	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	160,000	650	November	1940	G. E.-Cummins
Panama	5	B-B	Freight	Diesel-Elec.	190,000	1,000	October	1940	G. E.-Cummins
Peoria & Pekin Union	1	B-B	Sw.	Diesel-Elec.	210,000	640	May	May	G. E.-D. B.-Cater
Pere Marquette	1	B-B	Sw.	Diesel-Elec.	200,000	600	June	July	Electro Motive
Permanente Corp. (California)	1	B-B	Sw.	Diesel-Elec.	86,000	300	September	October	G. E.-Cummins
Phelps-Dodge Corp.	4	B-B	Sw.	Diesel-Elec.	250,000	1,000	April	June	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	200,000	600	June	July	Electro-Motive
Procter & Gamble Co.	1	B	Sw.	Diesel-Elec.	46,000	150	May	June	G. E.-Cummins
Reading Company	1	B-B	Sw.	Diesel-Elec.	.....	600	January	.....	West.-Baldwin
	1	B-B	Sw.	Diesel-Elec.	.....	600	April	.....	West.-St. L.-F. M.
Republic Steel Co	3	B-B	Sw.	Diesel-Elec.	160,000	500	September	October	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	200,000	600	September	October	Electro-Motive
City of Richmond	1	B-B	Sw.	Diesel-Elec.	100,000	360	November	.....	West.-D. B.-Cater
Seaboard Air Line	2	C-C	Pass.	Diesel-Elec.	308,495	2,000	1939	November	Electro-Motive
	5	C-C	Pass.	Diesel-Elec.	308,495	2,000	1939	December	Electro-Motive
	1	C-C	Pass.	Diesel-Elec.	298,960	2,000	1939	November	Electro-Motive
	1	C-C	Pass.	Diesel-Elec.	298,960	2,000	1939	December	Electro-Motive
Southern Pacific	1	B-B	Sw.	Diesel-Elec.	191,000	600	April	April	Electro-Motive
	6	B-B	Sw.	Diesel-Elec.	191,000	600	October	November	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	191,000	660	September	September	G. E.-American
	2	B-B	Sw.	Diesel-Elec.	191,000	660	October	December	G. E.-American
Tennessee Central	1	B-B	Sw.	Diesel-Elec.	199,000	660	November	November	West.-American
Texas-Mexican	7	B-B	Freight	Diesel-Elec.	142,000	660	January	.....	West.-W. (B.) Del.
United States Navy Dept. ...	1	B-B	Sw.	Diesel-Elec.	86,000	300	November	December	G. E.-Cummins
Wabash	1	B-B	Sw.	Diesel-Elec.	197,500	660	April	April	G. E.-American
	2	B-B	Sw.	Diesel-Elec.	198,400	600	April	Apr.-June	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	201,120	600	April	Apr.-June	Electro-Motive
Western Pacific	3	B-B	Sw.	Diesel-Elec.	200,000	600	November	December	Electro-Motive
Youngstown Sheet & Tube Co.	1	A-A	Sw.	Diesel-Elec.	130,000	340	April	October	Plymouth
	1	A-A	Sw.	Gas-Elec.	52,000	160	September	.....	Plymouth

United States—Export

Mexican National	2	B-B	Sw.	Diesel-Elec.	130,000	500	January	July	G. E.-Cooper-Bess.
Pampanga Sug. D. Co. (Manila).	1	B	Sw.	Diesel-Elec.	40,000	150	August	September	G. E.-Cummins
Wabash	1	B-B	Sw.	Diesel-Elec.	86,000	300	July	July	G. E.-Cummins



Freight Cars Ordered in 1939

Domestic orders for 54,439 cars more than triples 1938's volume; export market also thrice previous year; Canada has 42 per cent gain

By Frank W. Kraeger

Associate Editor

A TOTAL of 54,439 freight cars were ordered in the United States for domestic service during 1939. This total is more than thrice the volume purchased in 1938 (about 328 per cent) and exceeds that of any year since 1929, with the exception of 1936.

Table I—Freight Car Orders in 1939

For service in the United States	54,439
For export from the United States	1,476
For service in Canada and export from Canada	7,007
Grand total	62,922

Table II—Orders for Freight Cars 1929-1939

Year	Domestic	U. S. Export	Canadian	Total
1929	111,218	3,023	9,899	124,140
1930	46,360	1,200	1,936	49,496
1931	10,880	151	3,807	14,838
1932	1,968	77	501	2,546
1933	1,685	132	75	1,892
1934	24,611	1,323	12	25,946
1935	18,699	110	2,421	21,230
1936	67,544	526	271	68,341
1937	52,738	1,369	7,397	61,504
1938	16,539	442	4,902	21,883
1939	54,439	1,476	7,007 (Inc. Exp.)	62,922

The New York Central purchased the greatest number of cars during the year with total orders for 4,400. The Union Pacific was close behind with orders for 4,300 while the Norfolk & Western's total of 3,520 cars follows next.

Of the total number of cars ordered, approximately 19 per cent were requisitioned from railroad or car-line company shops. Outside builders therefore received a smaller proportion of car orders than in 1938, when company shops received but 12 per cent of the total, but showed a substantial gain over 1937 when company shops booked 28 per cent of the orders.

American builders received orders for 1,476 cars during the year from foreign buyers, or more than three-and-one-third times the export volume of 442 cars in 1938. In fact, the 1939 foreign market exceeded that of any year since 1929 by a substantial margin.

Table III—Freight Cars Built 1929-1939

Year	Domestic	U. S. Export	Canadian	Total
1929	82,240	3,168	8,557	93,965
1930	75,188	1,909	6,923	84,020
1931	13,205	409	4,633	18,247
1932	3,254	82	....	3,336
1933	2,160	151	550	2,861
1934	25,176	151	....	25,327
1935	6,933	888	801	8,622
1936	45,822	493	1,800	48,115
1937	75,003	1,121	6,595	82,719
1938	17,473	549	5,115 (Inc. Exp.)	23,137
1939	24,876	181	2,206 (Inc. Exp.)	27,263

Compared with the United States domestic and export purchase volumes, the 1939 record of Canadian builders and shops shows far less gain over the previous year, but, nevertheless, their sales total of 7,007 cars (including 66 for export) exceeds that of 1938 by more than 42 per cent; furthermore, it is higher than that for any year since 1929, with the exception of 1937.

Freight cars *built* in the United States for domestic service, as distinguished from cars *ordered,* totaled

24,876, an increase of 42 per cent as compared with the 17,473 cars turned out in 1938. American manufacturers produced 181 cars for export during the year, as compared with 549 in 1938 and 1,121 in 1937. Canadian plants turned out a total of 2,206 cars, of which 66 were for export, as compared with 5,115 cars in 1938 and 6,595 in 1937.

The foregoing production figures should not be confused with the totals of orders placed. Nor are they comparable with the figures on the number of cars installed as reported in statistics issued by the Association of American Railroads.

The appended tables contain a detailed statement of orders for new freight cars, or those having new bodies, placed during 1939 by railroads and industrial concerns; also those placed in Canada and for export. The list of orders was compiled from information furnished to the *Railway Age* by the railroads, private car lines, and other purchasers of cars, in response to requests for this information. The data thus furnished were then checked against lists of orders supplied by the car builders, and amplified accordingly, and also against the weekly reports of orders appearing in the Equipment and Supplies column of the *Railway Age*. The production figures were secured in response to requests to the car builders for this information. As in former years, the *Railway Age* is especially indebted to the American Railway Car Institute for its assistance in making available reports of the companies affiliated with that organization.

The *Railway Age* is not sufficiently optimistic to believe that the lists can include all the orders placed or that the figures of production are of scientific accuracy. However, it is believed that such omissions as occur will be found to be small and unimportant, and will not vitiate the value of the figures, particularly with respect to comparisons with preceding years, which, after all, is the primary purpose of the compilations.

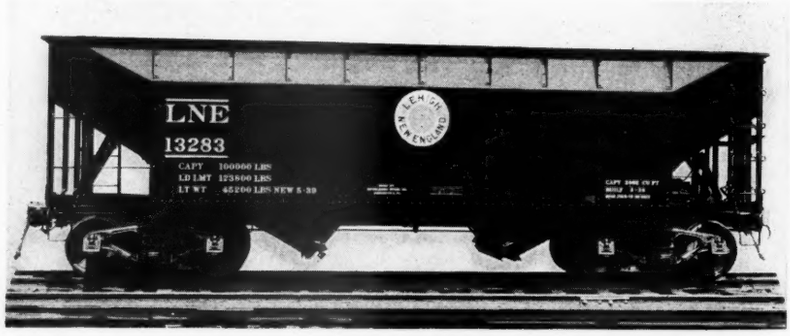
Freight Car Orders in 1939

For Service in the United States

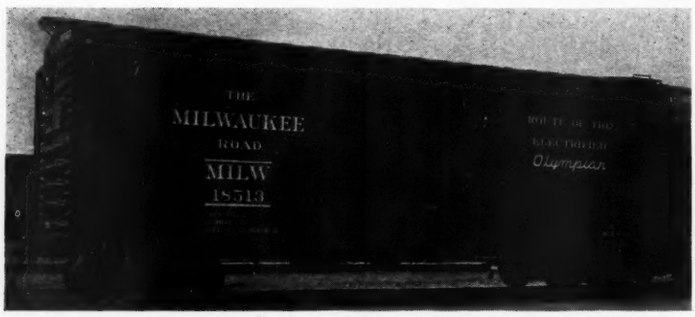
Purchaser	No.	Class	Capacity	Length ft.	Length in.	Construction	Weight	Date of order	Date of delivery	Builder
Aluminum Ore Co.	10	Cov. Hopper	140,000	44	0	Steel	61,520	May	August	Pullman-Standard
American Cyanimid Co.	1	Tank	10,000g	36	3¾	Steel	48,200	May	June	Amer. Car & Fdy.
	1	Tank	8,000g	..	..	Steel	.....	March	May	General American
American Refrigerator Transit Co.	100	Refrigerator	80,000	33	2¾	Steel	52,700	August	Jan. '40	Company Shops
Atchison, Topeka & Santa Fe.	200	Ballast	140,000	40	8	Steel	59,000	October	Mar. '40	Rodger Ballast
	200	Gondola	100,000	48	6	Steel	47,000	October	Apr. '40	Amer. Car & Fdy.
	1,800	D. S. Box	100,000	40	6	Steel	50,300	October	.....	Pullman-Standard
	300	Refrigerator	80,000	40	0	Steel	57,200	October	Feb. '40	General American
	100	Refrigerator	100,000	50	0	Steel	67,300	October	Feb. '40	General American
	50	Refrigerator	100,000	50	0	Steel	.....	October	Feb. '40	General American
	100	Flat	140,000	60	0	Steel	.....	October	Feb. '40	General American
	50	Gondola	140,000	65	6	Steel	59,700	October	Jan. '40	General American
Austin Powder Co.	1	Tank	8,000g	..	..	Steel	.....	May	June	General American
Baker Castor Oil Co.	1	Tank	4,000g	28	7¾	Steel	36,220	January	January	Amer. Car & Fdy.
	1	Tank	6,000g	..	..	Steel	.....	June	July	General American
Baltimore & Ohio	1	Hopper	80,000	29	0	Steel	35,200	February	September	Company Shops
	100	Hopper	140,000	26	3	Steel	51,800	May	.....	Company Shops
	1,000	Hopper	100,000	33	0	Steel	44,100	October	Mar. '40	Bethlehem
	500	Gondola	140,000	52	6	Steel	55,800	October	March	Amer. Car & Fdy.
	500	D. S. Box	100,000	40	6	Steel	51,422	October	1940	Pressed Steel
Barrett Co.	5	Tank	50,000	..	..	Steel	.....	November	Jan., '40	General American
Bay Chemical	1	Tank	6,000g	..	..	Steel	.....	November	Jan., '40	General American
Belle Alkali Co.	1	Tank	8,000g	..	..	Steel	.....	January	March	General American
Bessemer & Lake Erie	1,000	Hopper	180,000	40	8	Alloy Steel	48,700	November	.....	Pullman-Standard
	500	Gondola	100,000	46	0	Alloy Steel	47,040	November	1940	Pressed Steel
	500	D. S. Box	100,000	40	6	Alloy Steel	48,000	November	Feb. '40	Greenville
	50	Cov. Hopper	140,000	26	3⅝	Copper-Steel	51,500	November	March	Amer. Car & Fdy.
Birmingham Southern	100	Hopper	140,000	30	3	Steel	36,000	August	November	Pullman-Standard
	10	Flat	140,000	50	0	Steel	44,300	August	September	Pullman-Standard
Buffalo Elec-Chem. Co.	1	Tank	8,150g	37	6¾	Aluminum	36,000	September	December	Amer. Car & Fdy.
	1	Tank	8,150g	37	6¾	Steel	36,000	June	October	Amer. Car & Fdy.
California Dispatch Line	4	Tank	6,000g	41	0½	Steel	57,500	May	August	Amer. Car & Fdy.
	10	Tank	8,000g	36	9½	Steel	51,500	May	September	Amer. Car & Fdy.
	3	Tank	6,000g	33	4	Steel	52,200	June	September	Amer. Car & Fdy.
	2	Tank	6,000g	41	0½	Steel	57,500	September	December	Amer. Car & Fdy.
Chesapeake & Ohio	700	Hopper	100,000	33	0	Steel	40,400	September	November	General American
	650	Hopper	100,000	33	0	Steel	40,400	September	November	Pullman-Standard
	500	Hopper	100,000	33	0	Steel	40,200	September	December	Amer. Car & Fdy.
	150	Hopper	100,000	33	0	Steel	41,900	September	November	Ralston
	400	D. E. Gondola	100,000	48	6	Steel	48,700	September	November	Amer. Car & Fdy.
	100	D. E. Gondola	100,000	48	6	Steel	51,900	September	November	Greenville
Chicago & Illinois Midland	50	Hopper	140,000	41	3	Steel	54,000	November	December	Pullman-Standard
Chicago & North Western	300	D. S. Box	100,000	50	6	Alloy Steel	50,800	September	Jan. '40	Mount Vernon
	502	Hopper	100,000	39	0⅛	Steel	51,800	September	December	Pullman-Standard
Chicago, Burlington & Quincy	100	Flat	100,000	53	6	Steel	.....	1939	1940	Company Shops
	250	Hopper	110,000	34	3	Steel	.....	1939	1940	Company Shops
Chicago Great Western	100	Flat	100,000	53	6	St. Underframe	45,000	October	Jan. '40	Pullman-Standard
Chicago, Milw., St. Paul & Pac.	75	Caboose	60,000	28	0	Steel	38,700	May	August	Company Shops
	83	Box	100,000	40	6	Steel	42,800	July	September	Company Shops
	1,000	Box	100,000	40	6	Steel	42,800	May	December	Company Shops
	105	Box	100,000	40	6	Steel	42,800	September	Jan. '40	Company Shops
Chicago, Rock Island & Pacific	1,000	S. S. Box	100,000	40	6	Steel	46,420	October	1940	Pressed Steel
Cities Service Oil Co. of Del.	2	Tank	60,000	..	..	Steel	.....	April	May	General American
Columbian Gasoline Corp.	25	Cov. Hopper	80,000	45	10½	Steel	49,200	April	August	Amer. Car & Fdy.
Cons. Chem. Industries, Inc.	4	Tank	7,000g	32	3	Steel	42,000	September	October	Amer. Car & Fdy.
	3	Tank	10,000g	36	3¾	Steel	48,200	September	December	Amer. Car & Fdy.
	1	Tank	4,100g	28	7¾	Steel	37,400	October	December	Amer. Car & Fdy.
Delaware & Hudson	500	Hopper	100,000	30	11⅞	Steel	40,700	September	December	Amer. Car & Fdy.
	500	Hopper	110,000	30	11⅞	Steel	41,300	September	December	Bethlehem
Delaware, Lackawanna & Western	500	D. S. Box	100,000	40	6	Steel	46,480	November	Feb. '40	Magor
	100	Gondola	140,000	52	6	Steel	56,500	November	Jan. '40	Amer. Car & Fdy.
	500	Hopper	100,000	34	0	Steel	40,000	November	Jan. '40	Amer. Car & Fdy.
Denver & Rio Grande Western	400	Box	100,000	40	6	Alloy Steel	43,489	July	November	Pressed Steel
	100	Auto Box	100,000	40	6	Alloy Steel	46,919	July	November	Pressed Steel
	50	Gondola	140,000	60	0	Alloy Steel	56,939	July	November	Pressed Steel
	100	Stock	80,000	36	6	St. Underframe	.....	July	December	Company Shops
Detroit, Toledo & Ironton	25	Cov. Hopper	140,000	29	3	Steel	52,000	October	Jan. '40	Amer. Car & Fdy.
Dewey Portland Cement Co.	1	Cov. Hopper	.....	..	..	.....	.....	Dec. '38	1939	Amer. Car & Fdy.
Dow Chemical Co.	6	Tank	4,000g	28	7¾	Steel	37,800	February	April	Amer. Car & Fdy.
	2	Tank	10,000g	32	6½	Steel	45,400	March	June	Amer. Car & Fdy.
	4	Tank	4,000g	28	7¾	Steel	39,200	August	November	Amer. Car & Fdy.
	5	Tank	8,000g	..	..	Steel	.....	July	August	General American
	1	Tank	6,000g	..	..	Steel	.....	June	August	General American

Union Pacific Lightweight 50-Ton Box Car. Built at Railroad Company Shops. Underframes Furnished by the Mount Vernon Car Company

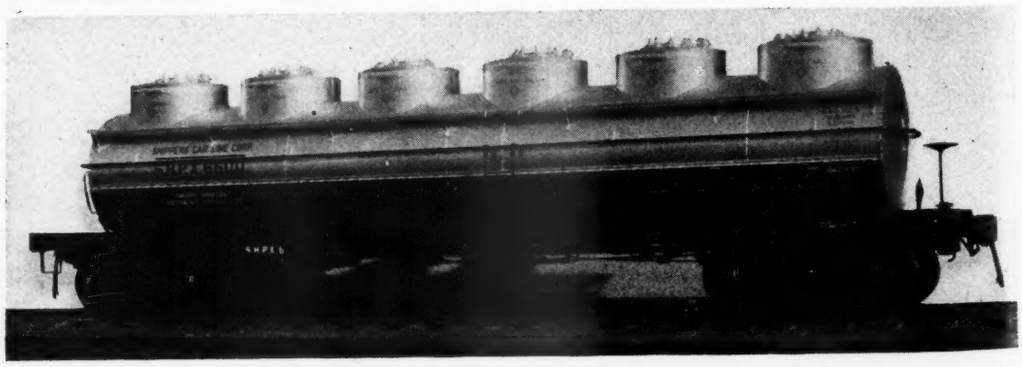
Southern Steel Frame Stock Car of 40 Tons Capacity. Built by the Ralston Steel Car Company



Lehigh & New England 50-Ton Hopper Car. Light Weight, 45,200 Lb. Builder, Bethlehem Steel Company



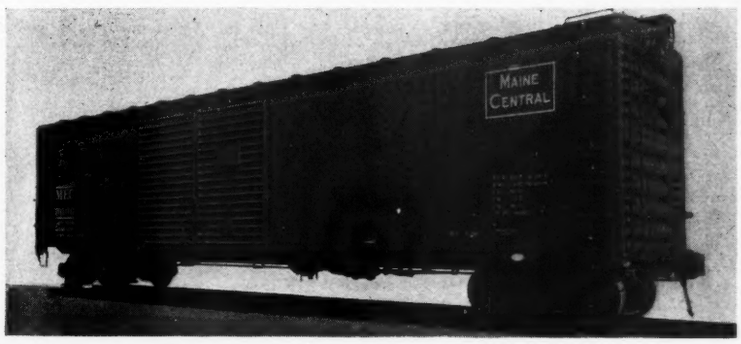
A Lightweight Double-Sheathed Box Car, 50 Tons Capacity, Built at the Milwaukee Shops, C. M. St. P. & P. of Low-Alloy Steel, Welded Construction. Light Weight, 42,800 Lb.



Six-Compartment 6,000-Gallon Tank Car for Transporting Wine—Welded Tank, Lined with Lithcote. Builder, American Car and Foundry Company

Covered Hopper Car for the Transportation of Bulk Commodities. Built for the New York, Chicago & St. Louis by the American Car and Foundry Co. Capacity 70 Tons; Light Weight, 51,600 Lb.

One of an Order of 700 Hopper Cars of 100,000 Lb. capacity, Built by the General American Transportation Corporation for the Chesapeake & Ohio



Fifty of These Double-Sheathed 40-Ton Box Cars Were Built for the Maine Central by the Magor Car Corporation. Light Weight, 50,300 Lb.

Alloy-Steel Automobile Box Car with Welded Duryea Cushion Underframe for the Denver & Rio Grande Western. Capacity 50 Tons; Light Weight, 44,600 Lb. Built by the Pressed Steel Car Company

40-Ton Box Car for the Southern. Light Weight, 44,500 Lb. Built by Pullman-Standard Car Mfg. Company

Purchaser	No.	Class	Capacity	Length ft.	Length in.	Construction	Weight	Date of order	Date of delivery	Builder
Electro Bleaching Gas Co.	2	Tank	60,000	34	8½	Steel	65,500	June	August	Amer. Car & Fdy.
Elgin, Joliet & Eastern	50	Cov. Hopper	140,000	26	3⅝	Steel	53,220	October	Apr. '40	Amer. Car & Fdy.
	500	Gondola	100,000	48	6	Steel	42,900	November	1940	Mount Vernon
	600	Hopper	100,000	34	9	Steel	43,800	November	May '40	Amer. Car & Fdy.
	300	Hopper	100,000	34	9	Steel	39,200	November	1940	Ralston
	300	Hopper	100,000	34	9	Steel	39,200	November	1940	Pullman-Standard
	300	Hopper	100,000	34	9	Alloy Steel	39,200	November	1940	General American
Erie	50	Flat	140,000	50	0	Steel	56,000	September	Jan. '40	Youngstown
	250	D. E. Gondola	140,000	65	6	Steel	67,900	September	December	Greenville
	200	Hopper	100,000	33	0⅛	Steel	41,500	September	December	Pullman-Standard
	300	Hopper	100,000	33	0⅛	Steel	41,500	September	Jan. '40	General American
	500	Box	100,000	40	6	Steel	45,900	September	Feb. '40	Amer. Car & Fdy.
	200	Box	100,000	40	6	Steel	45,900	September	Jan. '40	Pullman-Standard
Ethyl Gasoline Corp.	12	Tank	40,000	..	..	Steel	62,000	June	Aug.-Sept.	Amer. Car & Fdy.
	6	Tank	40,000	..	..	Steel	62,000	September	December	General American
	6	Tank	80,000	..	..	Steel	65,000	September	December	General American
	12	Tank	40,000	31	1½	Steel	52,700	November	Feb. '40	Amer. Car & Fdy.
	12	Tank	80,000	34	6½	Steel	65,400	November	Feb. '40	Amer. Car & Fdy.
Great Northern	25	Tank	16,000g	49	3	Steel	60,000	March	June	General American
	1,000	Box	100,000	40	6	Steel Frame	49,200	April	September	Pullman-Standard
	750	Ore	150,000	19	10⅞	Steel	42,500	October	Mar. '1940	Bethlehem
	750	Ore	150,000	19	10⅞	Steel	44,736	October	1940	Pressed Steel
Hercules Powder Co., Inc.	3	Tank	6,000g	..	..	Steel	.....	October	Jan., '40	General American
	6	Tank	6,000g	..	..	Steel	.....	October	Jan., '40	General American
	6	Tank	8,000g	..	..	Steel	.....	October	Jan., '40	General American
	2	Tank	6,000g	..	..	Steel	.....	October	Jan., '40	General American
	2	Tank	5,000g	..	..	Steel	.....	October	Jan., '40	General American
Hooker Electrochemical Co.	1	Tank	8,000g	36	3¾	Steel	44,000	March	April	Amer. Car & Fdy.
	1	Tank	8,000g	36	3¾	Steel	44,000	April	June	Amer. Car & Fdy.
	1	Tank	8,000g	36	3¾	Steel	44,000	May	June	Amer. Car & Fdy.
	1	Tank	8,000g	36	3¾	Steel	44,800	October	December	Amer. Car & Fdy.
	1	Tank	6,000g	..	..	Steel	.....	October	Jan., '40	General American
	6	Tank	60,000	..	..	....	.....	November	Jan., '40	General American
Huber Corporation, J. M.	5	Cov. Hopper	80,000	45	10½	Steel	49,500	March	July	Amer. Car & Fdy.
Illinois Central	500	D. S. Box	80,000	40	6	Steel	46,600	September	Jan. '40	Amer. Car & Fdy.
	500	D. S. Box	80,000	40	6	Steel	46,600	September	Jan. '40	Mount Vernon
	750	Hopper	100,000	33	0	Steel	45,400	September	December	Pullman-Standard
	750	Gondola	100,000	41	0	Steel	51,000	September	Jan. '40	General American
Inland Steel Co.	3	Flat	180,000	..	..	Steel	55,200	April	July	General American
	50	Gondola	140,000	42	0	Steel	.....	September	December	General American
Lake Terminal	100	Gondola	140,000	50	6	Steel	54,000	November	1940	Amer. Car & Fdy.
Lehigh & New England	100	Hopper	100,000	33	0	Steel	45,000	February	May	Bethlehem
	50	Cov. Hopper	140,000	26	3⅝	Steel	53,220	June	August	Amer. Car & Fdy.
	75	Cov. Hopper	140,000	26	3⅝	Steel	53,220	October	March '40	Amer. Car & Fdy.
Lehigh Valley	500	Hopper	100,000	31	0	Steel	40,700	March	July	Bethlehem
Linde Air Products Co.	20	Box	140,000	40	7⅝	Steel	52,398	September	November	Pressed Steel
Lone Star Gasoline Co.	2	Tank	100,000	38	1	Steel	63,900	October	Jan. '40	Amer. Car & Fdy.
Louisiana & Arkansas	300	Box	100,000	50	6	Steel	47,200	October	Feb. '40	Amer. Car & Fdy.
Louisville & Nashville	600	Hopper	100,000	33	0	Steel	41,000	October	Jan. '40	Amer. Car & Fdy.
	600	Hopper	100,000	33	0	Steel	41,000	October	Jan. '40	Pullman-Standard
Maine Central	252	D. S. Box	80,000	40	6	Steel	43,100	June	July-Sept.	Magor
	50	D. S. Box	80,000	50	6	Steel	50,500	June	July-Sept.	Magor
	150	Gondola	80,000	41	6	Steel	39,600	May	July-Sept.	Bethlehem
	150	Gondola	100,000	41	6	Steel	44,100	May	July-Sept.	Bethlehem
	10	Cov. Hopper	140,000	26	3⅝	Steel	53,200	October	March '40	Amer. Car & Fdy.
Merrimac Chemical	1	Tank	.....	..	..	.....	.....	Dec. '38	1939	General American
Midland Elec. Coal Corp.	5	Hopper	110,000	37	3½	Steel	52,600	August	November	Pressed Steel
Missouri-Illinois (Mo. Pac.)	250	S. S. Box	100,000	40	6	Steel	44,200	April	August	Mount Vernon
	50	Gondola	100,000	45	0	Steel	45,500	April	September	Mount Vernon
Missouri Pacific	1,000	Gondola	100,000	45	0	Steel	45,500	April	November	Mount Vernon
	5	Cab.-Ch.-Bag.	30,000	37	6½	Steel	52,000	February	December	Company Shops
Monsanto Chemical Co.	5	Tank	100,000	..	..	Steel	44,800	September	October	General American
	8	Tank	100,000	..	..	Steel	48,100	September	October	General American
	1	Tank	140,000	..	..	Steel	5,120	September	October	General American
	5	Tank	100,000	..	..	Steel	48,100	September	November	General American
	11	Tank	7,000g	32	3	Steel	44,900	September	November	Amer. Car & Fdy.
	1	Tank	8,000g	36	3¾	Steel	43,000	September	December	Amer. Car & Fdy.
	1	Tank	8,000g	36	6¼	Steel	44,850	October	Feb. '40	Amer. Car & Fdy.
	2	Tank	10,000g	..	..	Steel	.....	September	November	General American
Morrell Refrigerator Car Co.	100	Refrigerator	80,000	40	0	Steel Frame	63,800	February	May	General American
Nevada Consolidated Copper Co.	30	Air Dump	30 Cu. Yd.			.....	.....	October	.....	Austin-Western
Newburgh & South Shore	100	M. T. Gondola	140,000	50	6	Steel	52,600	November	April '40	Magor
New England Alcohol Co.	1	Tank	8,000g	36	3¾	Steel	40,800	June	July	Amer. Car & Fdy.
New York Central System	200	Cov. Hopper	140,000	25	6	Steel	54,100	April	August	Despatch Shops
	200	D.S. Box	95,000	50	6	Steel	69,700	September	November	Despatch Shops
	200	D.S. Box	110,000	50	6	Steel	55,000	October	Dec.-Jan. '40	Despatch Shops
	300	D.S. Auto-Box	100,000	50	6	Steel	61,800	October	December	Despatch Shops
	3,500	S.C. Hopper	110,000	31	6	Steel	41,300	October	1940	Despatch Shops
New York, Chicago & St. Louis	10	Cont. Gon.	200,000	46	0	Steel	46,100	July	September	Pullman-Standard
	25	Cov. Hopper	140,000	29	3	Steel	51,900	July	September	Amer. Car & Fdy.
	200¶	Box	100,000	40	6	Weld. Steel	38,614	September	.....	Pullman-Standard
N. Y., New Haven & Hartford	25	Caboose	.....	34	5½	Steel	50,000	October	Feb.-Mar. '40	Pullman-Standard
	250	Coal	100,000	33	0	Steel	43,225	October	Feb.-Mar. '40	Pullman-Standard
Norfolk & Western	1,000	Hopper	110,000	30	11¾	Steel	41,300	September	Jan. '40	Bethlehem
	1,250	Hopper	110,000	30	11¾	Steel	41,500	September	Mar. '40	Ralston
	1,250	Hopper	110,000	30	11¾	Steel	39,000	September	Jan.-Mar. '40	Virginia Bridge
	20	Cabin	.....	24	1⅜	Steel	52,000	September	Mar. '40	Company Shops
North American Car Corp.	3	Tank	60,000	32	7	Steel	40,500	March	April	Amer. Car & Fdy.
Northern Pacific	200	Hopper	100,000	33	0	Steel	40,000	October	Jan. '40	Amer. Car & Fdy.
	200	Hopper	100,000	33	0	Steel	40,300	October	Jan. '40	General American
	500	D.S. Box	100,000	40	6	Steel	50,000	October	Feb. '40	Pullman-Standard
	500	D.S. Box	100,000	40	9	Steel	46,500	October	Feb. '40	Amer. Car & Fdy.
	100	Ballast	140,000	40	8	Steel	59,000	October	Feb. '40	Amer. Car & Fdy.
	500	Gondola	100,000	41	6	Steel	51,080	October	Jan. '40	Pressed Steel
Oldbury Electro-Chemical Co.	1	Tank	3,600g	..	..	Steel	.....	July	November	General American
Pacific Fruit Express	20	Refrigerator	140,000	42	6	Steel Frame	77,600	May	November	Company Shops
	5	Refrigerator	140,000	50	1	Steel Frame	90,000	May	Jan. '40	Company Shops
Pennsylvania	1,000	D.S. Box	100,000	40	6	Steel	47,500	September	December	Company Shops
	1,000	D.S. Box	100,000	40	6	Steel	48,500	September	Apr. '40	Company Shops
	500	D.S. Box	100,000	50	6	Steel	53,500	September	June '40	Company Shops
Pennsylvania Salt Mfg. Co.	3	M. U. Tank	30,000	42	4⅛	Steel	33,500	January	February	Amer. Car & Fdy.
	3	Tank	60,000	34	2	Steel	65,100	September	October	Amer. Car & Fdy.
	3	M. U. Tank	30,000	42	4⅛	Steel	33,500	September	October	Amer. Car & Fdy.
	4	Tank	4,000g	28	7¾	Steel	37,000	October	December	Amer. Car & Fdy.
Pere Marquette	100¶	Box	100,000	40	6	Weld. Steel	38,614	October	.....	Pullman-Standard
Philadelphia Quartz Co.	10	Tank	100,000	36	3¾	Steel	43,540	October	November	Amer. Car & Fdy.
Phillips Petroleum Co.	1	Tank	100,000	..	..	Steel	70,000	October	Jan. '40	General American
	4	Tank	100,000	40	5	Steel	70,000	October	Jan. '40	Amer. Car & Fdy.
	6	Tank	100,000	40	5	Steel	70,000	October	Jan. '40	Amer. Car & Fdy.
	39	Tank	40,000	..	..	Steel	.....	December	Jan.-Feb., '40	General American

¶ Leased.

Purchaser	No.	Class	Capacity	Length ft.	Length in.	Construction	Weight	Date of order	Date of delivery	Builder
Pittsburgh Plate Glass	4	Tank	60,000	..	..	Steel	.....	January	January	General American
	5	M. U. Tank	.....	..	..	Steel	.....	December	Feb., '40	General American
Pittsburgh Steel	6	Bloom Car	140,000	31	11½	Steel	76,500	September	December	Pressed Steel
Read & Co., Inc., Chas. L.	2	Tank	4,000g	28	7¾	Steel	36,220	October	December	Amer. Car & Fdy.
Republic Steel Corp.	4	Air Dump	100,000	30	7⅝	Steel	69,300	April	September	Pressed Steel
	1	Cinder Pot	200,000	38	3⅞	Steel	96,300	July	October	Pressed Steel
Royster Guano Co., F. S.	5	Tank	7,000	..	..	Steel	.....	September	October	General American
St. Louis-San Francisco	5	Box	100,000	40	6	Steel	46,200	1939	February	Company Shops.
	9	Box	100,000	40	6	Steel	46,200	1939	December	Company Shops.
	4	Auto	100,000	40	6	Steel	51,500	1939	September	Company Shops.
	273	Box	80,000	40	6	Steel	47,700	1939	Oct.-Dec.	Company Shops.
	5	Auto	100,000	50	7¾	Steel Frame	66,400	1939	Jan. '40	Company Shops.
St. Louis-South Western	100	Gen. Service	100,000	42	11	Steel	48,900	1939	June-Aug.	Company Shops.
	56	Flat	80,000	42	0	.....	.....	1939	.....	Company Shops.
	50	Automobile	.....	..	..	.....	.....	1939	.....	Company Shops.
Seaboard Air Line	700	D. S. Box	100,000	40	6	Steel	48,000	October	1940	Pullman-Standard
	100	Flat	100,000	50	0	Steel	43,400	October	Jan. '40	Amer. Car & Fdy.
	100	Hopper	140,000	40	8	Steel	48,000	October	Jan. '40	Bethlehem
Seley & Simon, Louis E.	1	Tank	10,500g	40	5	Steel	69,200	February	April	Amer. Car & Fdy.
Semet-Solvay Co.	1	Tank	10,000g	35	10	Steel	45,200	February	April	**Amer. Car & Fdy.**
	1	Tank	10,000g	36	3¾	Steel	47,500	May	July	Amer. Car & Fdy.
	5	Tank	10,000g	36	3¾	Steel	45,000	June	August	Amer. Car & Fdy.
	2	Tank	8,000g	36	3¾	Steel	40,800	June	August	Amer. Car & Fdy.
	5	Tank	6,000g	32	3	Steel	38,400	June	August	Amer. Car & Fdy.
	1	Tank	10,000g	36	3¾	Steel	45,000	August	September	Amer. Car & Fdy.
	20	Tank	10,000g	36	3¾	Steel	45,000	October	December	Amer. Car & Fdy.
	1	Tank	10,000g	36	1¾	Steel	46,600	October	December	Amer. Car & Fdy.
	1	Tank	10,000g	36	3¾	Steel	47,600	November	Jan. '40	Amer. Car & Fdy.
	5	Tank	10,000g	..	..	Steel	.....	October	December	General American
Shell Chemical Co.	2	Tank	11,200g	..	..	Steel	.....	October	Jan., '40	General American
Shippers' Car Line	3	Tank	40,000	40	9½	Steel	69,000	1939	1939	Amer. Car & Fdy.
	8	M. U. Tank	30,000	42	4⅛	Steel	53,400	1939	1939	Amer. Car & Fdy.
	63	Tank	4,000g	..	..	Steel	.....	1939	1939	Amer. Car & Fdy.
	7	Tank	4,500g	..	..	Steel	.....	1939	1939	Amer. Car & Fdy.
	1	Tank	5,000g	..	..	Steel	.....	1939	1939	Amer. Car & Fdy.
	160	Tank	6,000g	..	..	Steel	.....	1939	1939	Amer. Car & Fdy.
	10	Tank	6,200g	..	..	Steel	.....	1939	1939	Amer. Car & Fdy.
	1	Tank	7,000g	..	..	Steel	.....	1939	1939	Amer. Car & Fdy.
	1,038	Tank	8,000g	..	..	Steel	.....	1939	1939	Amer. Car & Fdy.
	393	Tank	10,000g	..	..	Steel	.....	1939	1939	Amer. Car & Fdy.
	2	Tank	12,000g	..	..	Steel	.....	1939	1939	Amer. Car & Fdy.
	1	Cov. Hopper	140,000	29	3	Steel	51,900	August	October	Amer. Car & Fdy.
	10	Cov. Hopper	140,000	29	3	Steel	51.900	October	Jan. '40	Amer. Car & Fdy.
Southern Acid & Sulpher	2	Tank	.....	..	..	Steel	. ...	October	1939	General American
Southern	1	Box	.....	..	..	.....	.....	Dec. '38	1939	Pullman-Standard
Stauffer Chemical Company	3	Tank	100,000	..	..	Steel	.....	September	November	General American
	1	Tank	8,000	..	..	Steel	.....	February	April	General American
Tennessee Central	65	Hopper	100,000	33	0	Steel	40,800	October	Jan. '40	Amer. Car & Fdy.
Tennessee Coal Iron & R. R.	49	Ore	140,000	20	11⅞	Steel	44,000	September	.....	Pullman-Standard
Texas & Pacific	500	S. S. Box	100,000	40	6	Steel	46,500	October	Feb. '40	Mount Vernon
Union Oil Co. of Calif.	2	Tank	12,000g	42	0½	Steel	82,000	August	November	General American
Union Pacific	2,000	Box	.....	..	..	.....	.....	February	1939	Company Shops
	300	Flat	.....	50	0	.....	.....	April	1939	Company Shops
	2,000	Box	.....	..	..	.....	.....	September	.....	Company Shops
Union Railroad Co.	60	Dump	140,000	45	6	Steel	72,500	October	April '40	Differential
	40	Air Dump	140,000	43	7	Steel	92,900	October	April '40	Magor
	10	Caboose	.....	24	0	Steel	40,700	March	September	Greenville
Union Starch & Refrigerator Co.	5	Tank	8,000g	..	..	Steel	.....	November	Feb., '40	General American
Union Tank Car Co.	100	Tank	6,500g	33	10	Steel	49,400	September	Feb. '40	Amer. Car & Fdy.
United Carbon Co., Inc.	10	Cov. Hopper	80,000	45	10½	Steel	52,194	March	May	Amer. Car & Fdy.
	10	Cov. Hopper	80,000	45	10½	Steel	51,840	April	June	Amer. Car & Fdy.
United States Navy Dept.	4	Box	.....	..	..	.....	.....	Dec. '38	1939	Greenville
	3	Flat	120,000	34	0	St. Underframe	114,600	January	June	Haffner-Thrall
	2	D. S. Box	100,000	40	0	Steel	44,100	February	Apr. '40	Greenville
	2	Flat	100,000	40	0	St. Underframe	38,100	February	Apr. '40	Magor
	2	D. S. Box	100,000	39	9⅞	Steel	51,000	April	July	Greenville
	2	Flat	100,000	40	0	St. Underframe	...	April	Aug. '40	Haffner-Thrall
	2	Box	100,000	40	6	Steel	45,000	September	December	Amer. Car & Fdy.
	15	Flat	100,000	40	0	St. Underframe	38,800	October	December	Amer. Car & Fdy.
	8	Gondola	100,000	40	6	Steel	44,200	October	December	Amer. Car & Fdy.
	10	Box	100,000	40	6	Steel	45,000	October	December	Amer. Car & Fdy.
	1	Hopper	100,000	30	0	Steel	37,820	October	December	Amer. Car & Fdy.
	6	Flat	100,000	39	10	St. Underframe	36,000	April	June	Greenville
	2	Flat	100,000	39	10	St. Underframe	36,000	September	Jan. '40	Greenville
	2	D. S. Box	100,000	40	6	Steel	44,400	September	Jan. '40	Greenville
	17	Flat	.....	..	..	.....	.....	October	1940	Haffner-Thrall
U. S. Sugar Corp.	20	Cane	60,000	39	3⅞	Steel	32,825	June	September	Magor
United States War Dept.	25	Tank	10,000g	36	3¾	Steel	48,000	October	December	Amer. Car & Fdy.
	50	Tank	10,000g	36	3¾	Steel	47,200	October	December	Amer. Car & Fdy.
	47	Tank	5,000g	31	10¾	Steel	34,000	October	Jan. '40	Amer. Car & Fdy.
	3	Tank	5,000g	25	9¾	Steel	22,000	October	Jan. '40	Amer. Car & Fdy.
	1	Flat	.....	..	..	Steel	.....	Dec. '38	April	Bethlehem
Utah Copper Co.	200	Ore	200,000	24	5⅛	Steel	47,932	October	1940	Pressed Steel
Virginia Smelting Co.	1	Tank	60,000	..	..	Steel	.....	September	Jan., '40	General American
Virginian	1,000	Hopper	110,000	33	0	Steel	42,200	September	May '40	Company Shops
Wabash	35	Caboose	.....	35	3¾	Steel	46,900	April	September	Company Shops
Western Maryland	100	D. E. Gon.	100,000	52	6	Steel	51,100	July	October	Greenville
	10	Flat	100,000	50	0	St. Underframe	48,700	July	October	Greenville
	500	Box	100,000	40	6	Steel	48,164	June	December	Pressed Steel
	500	Hopper	110,000	31	0	Steel	42,000	June	Sept.-Oct.	Bethlehem
Weyerhaeuser Timber Co.	10	Log. Cars	80,000	44	0	Wood	27,000	1939	.....	Company Shops
	50	Log. Cars	80,000	44	0	Wood	27,000	1939	.....	Union St. & Rail
	1	Caboose	40,000	34	0	Wood	.....	February	April	Pac. Car & Fdy.
Wheeling & Lake Erie	400	Hopper	120,000	33	⅛	Steel	40.600	September	Nov.-Dec.	Pullman-Standard
	100	Hopper	120,000	33	⅛	Steel	40,600	September	December	Ralston
	200	Box	100,000	40	6 1/16	Steel	35,900	October	December	Pullman-Standard
White Pass & Yukon	1	Gondola	60,000	33	0	.....	27,000	September	Jan. '40	Pac. Car & Fdy.
Wisconsin Central (M. St. P. & S. S. M.)	100	Auto	100,000	50	0	Steel	50,000	August	December	Pullman-Standard
	100	Flat	100,000	52	6	Steel	45,300	August	December	Pullman-Standard
Youngstown & Northern	100	Gondola	140,000	40	0	Steel	53,000	November	March '40	Magor

United States—Export

Purchaser	No.	Class	Capacity	Length ft.	Length in.	Construction	Weight	Date of order	Date of delivery	Builder
Aluminum Co. of America	50	Dump	45,000	20	0	Steel	30,650	September	1940	Pressed Steel
	2	Flat	45,000	23	4	Steel	16,500	September	1940	Pressed Steel
Argentine State Railways	200	Tank	.....	..	..	.....	.....	November	.....	Amer. Car & Fdy.

Purchaser	No.	Class	Capacity	Length ft.	Length in.	Construction	Weight	Date of order	Date of delivery	Builder
Central Rys. of Brazil.....	250	Box	66,138	43	3⅜	.....	38,195	October	.....	Pullman-Standard
	150	Flat	99,207	44	1	.....	32,507	October	.....	Pullman-Standard
	100	Gondola	132,276	39	4½	.....	44,283	October	.....	Pullman-Standard
	100	Flat	60,000	..	..	.....	.....	October	.....	Amer. Car & Fdy.
	200	Box	60,000	..	..	.....	.....	October	.....	Amer. Car & Fdy.
	200	Gondola	60,000	..	..	.....	.....	October	.....	Amer. Car & Fdy.
F. C. de Antioquia (Colombia)..	30	Box	60,000	33	10	Steel	21,550	September	December	Pressed Steel
F. C. Elec. al Pacifico (Costa Rica)	50	D. S. Box	74,500	35	0	Steel Frame	30,648	July	October	Magor
Intern. Rys. of Central America	5	Tank	7,500g	36	3	Steel	37,415	July	September	Magor
Koppel (Phil.) Inc (Manila)....	2	Gondola	40,000	31	0	Steel Frame	15,200	April	July	Pressed Steel
Manila	50	Box	66,120	35	11¾	Steel	31,625	June	September	Pressed Steel
O. Phillipp & Sons Co. (S. A.)..	10	Flat	40,000	26	3	Steel	14,900	January	February	Pressed Steel
United Fruit Company (Costa Rica)	77	Flat	50,000	..	..	.....	.....	December	.....	Magor

Canada

Purchaser	No.	Class	Capacity	Length ft.	Length in.	Construction	Weight	Date of order	Date of delivery	Builder
Canadian General Transit Co.....	2	Tank	6,400g	28	10⅝	Steel	40,500	January	February	Can. Car & Fdy.
	3	Tank	7,000g	30	5	Steel	44,150	March	May	Can. Car & Fdy.
	6	Tank	7,000g	30	5	Steel	44,150	September	November	Can. Car & Fdy.
	1	Tank	4,150g	28	10⅛	Steel	41,200	September	December	Can. Car & Fdy.
	3	Tank	7,000g	30	5	Steel	44,150	October	December	Can. Car & Fdy.
	10	Tank	7,000g	30	5	Steel	44,150	October	December	Can. Car & Fdy.
	4	Tank	4,200g	28	6	Steel	37,700	October	December	Can. Car & Fdy.
	1	Tank	11,410g	40	0½	Steel	37,700	October	December	Can. Car & Fdy.
Canadian National	600	S. S. Box	80,000	40	6	Steel	43,600	March	May-June	Can. Car & Fdy.
	625	S. S. Box	80,000	40	6	Steel	44,200	March	June-Aug.	Eastern Car
	725	D. S. Box	80,000	40	6	Steel	44,500	March	May-July	National Steel
	100	Refrigerator	80,000	40	0	Steel	70,200	March	Oct.-Mar. '40	Company Shops
	25	Caboose	80,000	29	2	St. Underframe	43,900	March	Oct.-Dec.	Company Shops
	500	Flat	100,000	52	0	Steel	45,000	October	.....	Can. Car & Fdy.
	1,100	S. S. Box	80,000	40	6	Steel	43,350	October	1940	Can. Car & Fdy.
	1,075	S. S. Box	80,000	40	6	Steel	43,500	October	1940	Eastern Car
	590	D. S. Box	80,000	40	6	Steel	44,000	October	Jan. '40	National Steel
Canadian Pacific	500	D. S. Box	80,000	40	6	Steel	.....	October	1940	National Steel
	500	D. S. Box	80,000	40	6	Steel	44,200	October	1940	Can. Car & Fdy.
	200	Refrigerator	80,000	39	4	Steel	.....	October	1940	National Steel
	100	D. S. Auto	80,000	40	4⁹/₁₆	Steel	48,480	October	1940	Can. Car & Fdy.
International Nickel Co.....	20	Ore	160,000	23	2	Steel	47,300	January	April	Can. Car & Fdy.
Shell Oil Co.....	1	Tank	10,500g	37	0	Steel	76,660	June	August	Can. Car & Fdy.
Sydney & Louisburg.....	200	Hopper	125,000	30	0½	Steel	41,000	September	May '40	Eastern Car
Temiskanning & Northern Ontario	50	Ballast	150,000	43	6	Steel	54,000	January	May	National Steel

Canada — Export

Purchaser	No.	Class	Capacity	Length ft.	Length in.	Construction	Weight	Date of order	Date of delivery	Builder
Millom & Askam Hematite Ir. Co. (Eng.)	6	Rail Cars	60,000	30	0	St. Underframe	25,300	April	June	Can. Car & Fdy.
Trinadad Government	60	Open Wagon	20,000	17	9¼	St. Underframe	12,500	January	February	Can. Car & Fdy.

A Billion Dollars of Railway Buying

(*Continued from page 57*)

13 per cent, from the total on November 1, 1938, and a decline of $25,092,000 or 34 per cent than the total on April 1, 1938, when crosstie stocks were the highest in four years.

Miscellaneous material on hand November 1 was approximately one per cent less than the corresponding inventory a year previous and approximately $47,466,000, or 19 per cent, below December 31, 1936, when these stocks were at their peak. It follows from this that the large volume of purchasing by the railroads during the last six months of 1939 has as yet caused no accumulation of unused material in the aggregate, as was the case in 1937 but that inventories in the aggregate are substantially lower than at any time during the past year.

Compared with November 1, 1938, storehouse stocks on November 1, 1939, were *increased* 66 per cent on the Colorado and Southern, 13 per cent on the Erie, 14 per cent on the Great Northern, 25 per cent on the Lake Superior & Ishpeming, 26 per cent on the Lehigh & New England, 5 per cent on the Lehigh Valley, 21 per cent on the Missouri & Arkansas, 15 per cent on the Montour, 18 per cent on the Pere Marquette, 26 per cent on the St. Louis Southwestern, 6 per cent on the Seaboard Air Line, 20 per cent on the Southern and 7 per cent on the Spokane, Portland & Seattle. However, they *declined* 10 per cent on the Santa Fe, 24 per cent on the Central of Vermont, 26 per cent on the Chicago & Illinois Midland, 6 per cent on the Chicago, Burlington & Quincy, 7 per cent on the Delaware, Lackawanna & Western, 17 per cent on the Detroit, Toledo & Ironton, 24 per cent on the Illinois Central, 11 per cent on the Northern Pacific, 20 per cent on the Reading, 11 per cent on the St. Louis-San Francisco, 7 per cent on the Union Pacific, 23 per cent on the Western Pacific and 10 per cent on the Western Maryland.

Materials, exclusive of fuel, received by the Class I railroads in 1939 were equal to approximately 12.5 per cent of gross operating revenues. The corresponding ratio was 9.8 per cent in 1938, 16.7 per cent in 1937, 13.3 per cent in 1936, 10.6 per cent in 1935, 12.0 per cent in 1934, 8.6 per cent in 1933 and 1932, 10.8 per cent in 1931, 13.8 per cent in 1930 and 15.7 per cent in 1929 and previous years. The relation between purchases and revenues has been applied as a measure of deferred buying and an indicator of the extent to which the railroads are catching up with it or falling behind, on the assumption that while less material is required by the railroads in periods of light traffic than in periods of heavy traffic, the purchases of materials which *are* required for adequate maintenance should bear a reasonably constant relation to revenues. After adjusting for changing prices, it has been computed that in the period prior to 1937 the railroads spent approximately $755,000,000 less in the aggregate for materials, exclusive of equipment and fuel, than would have been spent if they had consistently appropriated as much per dollar of their operating revenues each year as in 1929. By the same reasoning, they spent $57,000,000 more in the first eight months of 1937 than would have been spent under the rate of buying in 1929 but this was reduced to an all-year total of $22,000,000 by declines in the last four months of 1937. By the same reasoning the railroads fell behind approximately $200,000,000 during 1938 and $100,000,000 in 1939 (excluding undelivered materials), with the result that an indicated total of deferred buying now exists of approximately $1,000,000,000.

Passenger-Train Cars Ordered in 1939

Total of 325 cars purchased shows gain of 20 per cent over 1938; export field shows marked improvement

By Frank W. Kraeger
Associate Editor

AMERICAN car builders and shops received domestic orders for a total of 325 passenger-train cars during 1939, an increase of 20 per cent as compared with the number ordered during 1938.

This total includes all revenue passenger-train cars, including separate members of articulated units, except those containing power plants, which are listed and totaled separately as rail-motor cars. Orders were placed during 1939 for 3 of the latter, as compared with 12 units purchased in 1938. So-called "cars" devoted entirely to the housing of power plant facilities and classed as non-revenue, are listed under "locomotives" elsewhere in this issue.

Only one of the cars purchased this year was ordered from a railroad company shop. In 1938, carrier shops booked orders for 30 per cent of the total purchased.

Foreign orders for 28 passenger-train cars were placed with American builders during 1939, thus ending a four-year period of complete inactivity in this field.

Table I—Passenger-Train Car Orders in 1939

For service in the United States	325
For export from the United States	28
For service in Canada and export from Canada	87
Grand total	440

Table II—Orders for Passenger-Train Cars 1929-1939

Year	Domestic	U. S. Export	Canadian	Total
1929	2,303	33	122	2,458
1930	667	15	203	885
1931	11	21	11	43
1932	39	..	..	39
1933	6	..	..	6
1934	388	15	..	403
1935	91*	..	16	107*
1936	307†	..	10	317†
1937	829	..	99	928
1938	269	..	24	293
1939	325	28	87 (Inc. Exp.)	440

* Revised to include 28 body units of articulated or partially-articulated trains.

† Includes 102 body units of articulated or partially-articulated trains.

Table III—Passenger-Train Cars Built 1929-1939

Year	Domestic	U. S. Export	Canadian	Total
1929	1,254	20	162	1,436
1930	1,264	40	210	1,514
1931	198	21	66	285
1932	39	..	...	39
1933	6	..	...	6
1934	268	15	...	283
1935	197	..	...	197
1936	142	..	10	152
1937	664	..	70	734
1938	264	..	38	302
1939	194	..	27 (Inc. Export)	221

For the third successive year, no rail-motor cars were ordered from abroad.

Canadian builders and shops received orders during the year for 87 cars, of which 12 were for export, a volume which is more than three-and-a-half times the Canadian total for 1938 and exceeds that of any year since 1930, except 1937.

Passenger-train cars *built* in the United States for domestic service, as distinguished from those *ordered,* totaled 194, as compared with 264 cars turned out in 1938. No cars for export were built during 1939, making the fifth successive year of inactivity in production for export. Canadian builders completed 27 cars during the year, of which 12 were for export, as compared with 38 in 1938.

The accompanying lists of orders, amplifying the summary tables also published herewith, have been com-

piled in the usual way. Returns from railroads were checked against lists of orders, supplied by the car builders, largely through the courtesy of the American Railway Car Institute.

Passenger-Train Car Orders in 1939

For Service in the United States

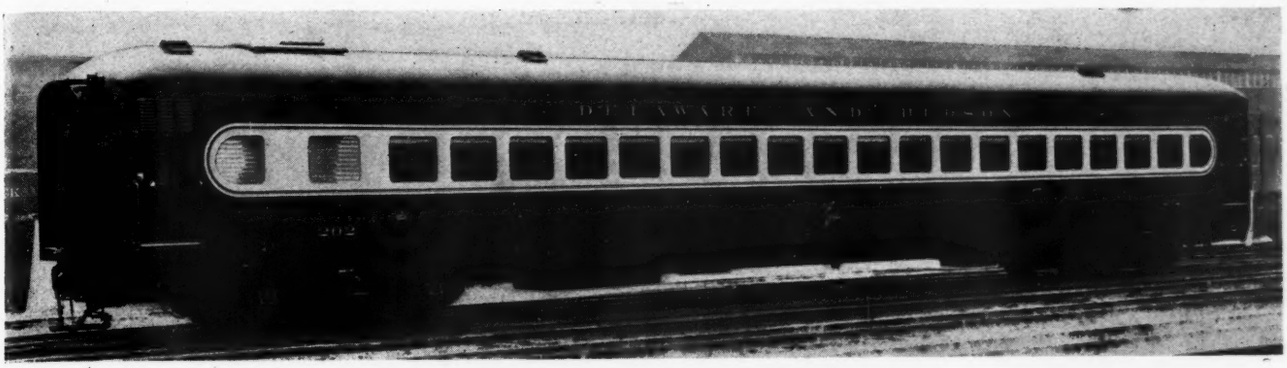
Purchaser	No.	Class	Length Ft.	Length In.	Seating Capacity	Weight	Date of Order	Date of Delivery	Builder
Atchison, Topeka & Santa Fe	2 AC	Bag.-Chair	73	6	36	102,455	July	Feb., '40	Pullman-Standard
	1 AC	Bag.-Dorm.-Ch.	73	6	45	104,406	July	Feb., '40	Pullman-Standard
	1 AC	Chair-Obs.	73	11	62	102,967	July	Feb., '40	Pullman-Standard
	1 AC	Club-Lounge	73	6	39	105,390	July	Feb., '40	Pullman-Standard
	1 AC	Lunch Ctr.-Din.	80	4	38	117,577	July	Feb., '40	Pullman-Standard
	1 AC	Diner	80	4	36	117,007	July	Feb., '40	Pullman-Standard
	2	Postal	63	1¾	..	85,174	July	Jan., '40	Budd
	2	Club Chair	79	8	30	100,200	July	Jan., '40	Budd
	1 AC	Coach	85	0	68	.....	June	1940	Pacific Ry. Equip.
	1	Coach	79	8	52	103,100	November	.....	Budd
Atlantic Coast Line	2 AC	P. & B.-Dorm.	85	..	22	107,500	June	December	Budd
	6 AC	Coach	85	..	60	105,750	June	December	Budd
	2 AC	Coach	85	..	52	106,800	June	December	Budd
	2 AC	Diner	85	..	48	113,800	June	December	Budd
	2 AC	Obs.-Tav.	85	..	57	105,900	June	December	Budd
Chicago & North Western	2 AC	Tav.-Lounge	82	0	36	120,600	January	September	Pullman-Standard
	6 AC	Coach	82	0	64	113,600	January	September	Pullman-Standard
	2 AC	Coach	82	0	56	113,700	January	September	Pullman-Standard
	2 AC	Diner	82	8	56	125,100	January	September	Pullman-Standard
	6 AC	Parlor	82	0	35	112,900	January	September	Pullman-Standard
	2 AC	Parlor-Obs.	82	0	41	114,500	January	September	Pullman-Standard
Chicago, Burlington & Quincy	1	Baggage	72	8	..	85,650	September	1940	Budd
	1	Bag. & Mail	72	8	..	88,780	September	1940	Budd
	2 AC	Coach	79	8	52	102,745	September	1940	Budd
	1 AC	Diner-Lounge	88	7	44	118,200	September	October	Budd
	1	.....	..	..	..	.....	1939	1939	Company Shops
	1 AC	Coach	85	0	68	.....	September	1940	Pacific Ry. Equip.
Chicago, Rock Island & Pacific	2	Bag. & Mail	67	0	..	80,000	June	September	Budd
	2	Baggage	67	8	..	79,950	March	September	Budd
	2	Coach-Mail	79	8	44	106,950	March	September	Budd
	4	Coach	79	8	52	104,700	March	September	Budd
	2	Diner	83	0	46	114,000	March	September	Budd
Delaware & Hudson	6 AC	Coach	84	9	76	115,000	March	November	Amer. Car & Fdy.
Florida East Coast	6	Coach	85	0	60	105,750	July	December	Budd
	2	Coach-Host.	85	0	52	106,800	July	December	Budd
	2	Diner	85	0	48	113,800	July	December	Budd
	1	Bag.-Dorm.	85	0	22	107,500	July	December	Budd
	1	Bag.-Dorm.	85	0	57	105,900	July	December	Budd
	2	Tavern Lounge	85	0	22	106,200	July	December	Budd
Great Northern	1 AC	Coach	85	0	68	.....	July	1940	Pacific Ry. Equip.
Kansas City Southern	3	Mail-Bag.	84	6	..	99,469	November	.....	Pullman-Standard
	5 AC	Coach	84	6	74	106,893	November	.....	Pullman-Standard
	3 AC	Parlor-Obs.	84	7	41	111,424	November	.....	Pullman-Standard
Lehigh Valley	5	Coach	74	8¾	82	114,800	March	November	Pullman-Standard
	5	Coach	74	8¾	92	113,200	March	October	Pullman-Standard
Missouri Pacific	2	Mail-Storage	72	10	..	86,000	April	Feb., '40	Amer. Car & Fdy.
	2	Mail & Bag.	72	10	..	87,000	April	Feb., '40	Amer. Car & Fdy.
	2	Coach	84	6	76	107,500	April	Feb., '40	Amer. Car & Fdy.
	2	Coach	84	6	56	107,500	April	Feb., '40	Amer. Car & Fdy.
	2	Din.-Bar.-L	84	6	46	118,000	April	Feb., '40	Amer. Car & Fdy.
	2	Parlor-Obs.	84	6	37	106,000	April	Feb., '40	Amer. Car & Fdy.
New York Central System	1	Coach	84	8	60	108,000	March	December	Budd
Pennsylvania	12 AC	Coach	84	8	66	107,400	January	June	Budd
	5 AC	Diner	84	6	48	118,170	January	August	Budd
	5 AC	Diner	84	6	48	113,660	Dec., '38	August	Pullman-Standard
	5 AC	Diner	84	6	48	113,400	January	August	Amer. Car & Fdy.
	1 AC	Coach	84	8	66	110,000	March	November	Budd
	3 AC	Coach	84	8	66	110,000	July	December	Budd
Pullman Company	125	Sleeping	..	..	..	.....	1939	.....	Pullman-Standard
Richmond, Fredericksburg & Potomac	6	Bag.-Exp.	70	0	..	60,000	December	.....	Amer. Car & Fdy.
Seaboard Air Line	2 AC	Coach-Bag.	85	0	22	106,850	August	November	Budd
	2 AC	Diner	85	0	48	115,750	August	November	Budd
	5 AC	Coach	85	0	60	103,700	August	November	Budd
	2 AC	Coach-Tavern	85	0	60	108,350	August	November	Budd
	2 AC	Coach-Obs.	85	0	72	101,800	August	November	Budd
	1 AC	Diner-Lounge	85	0	42	115,750	August	November	Budd
Southern Pacific	2 AC	Chair-Bag.	81	0	44	111,230	March	.....	Pullman-Standard
	2 AC†	Coffee	72	0	80	96,071	March	.....	Pullman-Standard
	2 AC†	Kitchen	59	6	..	97,347	March	.....	Pullman-Standard
	2 AC†	Diner	72	0	72	96,238	March	.....	Pullman-Standard
	2 AC	Parlor-Obs.	80	0½	40	107,512	March	.....	Pullman-Standard
	2 AC	Parlor	81	0	32	110,091	March	.....	Pullman-Standard
	2 AC	Tavern	81	0	46	115,339	March	.....	Pullman-Standard
	2 AC	Chair	81	0	53	112,365	March	.....	Pullman-Standard
	6 AC†	Chair (Men)	68	0	49	92,041	March	.....	Pullman-Standard
	6 AC†	Chair (Women)	68	0	51	93,679	March	.....	Pullman-Standard

AC—Indicates cars are air-conditioned.
†—Body units of articulated or partially articulated trains.

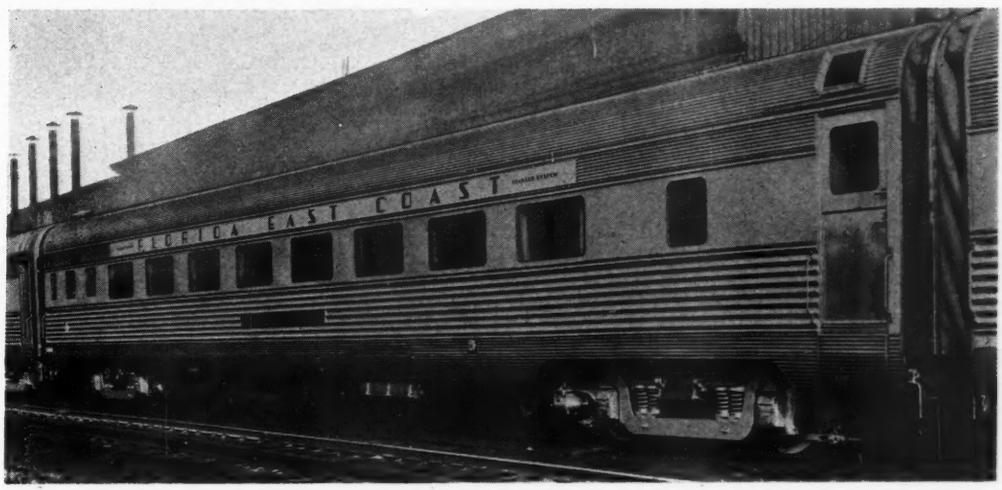
United States—Export

Purchaser	No.	Class	Length Ft.	Length In.	Seating Capacity	Weight	Date of Order	Date of Delivery	Builder
Companhia dos Caminhos de Ferro Portugueses	11	Coach	77	10½	58	.....	September	.....	Budd
	9	Coach	77	10½	106	.....	September	.....	Budd
	4	Bag.-Coach	77	10½	63	.....	September	.....	Budd
	2	Coach-Din.	77	10½	83	.....	September	.....	Budd
	2	Coach-Din.	77	10½	60	.....	September	.....	Budd
Int. Rys. of Central Amer. (Guatemala)	1*	Business	50	0	..	59,400	1939	1939	Company Shops
	1*	Baggage	50	0	..	34,400	1939	1939	Company Shops
	3*	Coach	50	0	56	33,800	1939	1939	Company Shops
	1*	Coach	50	0	56	33,800	1939	1939	Company Shops

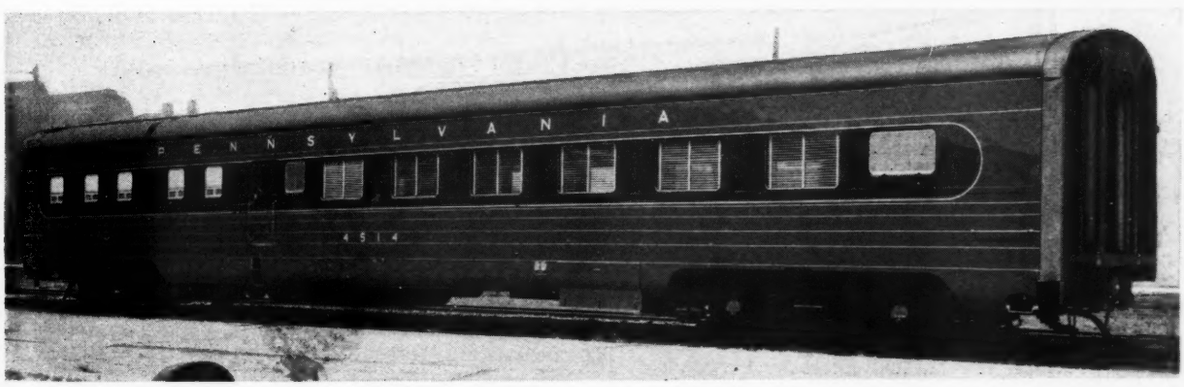
* Not included in total.



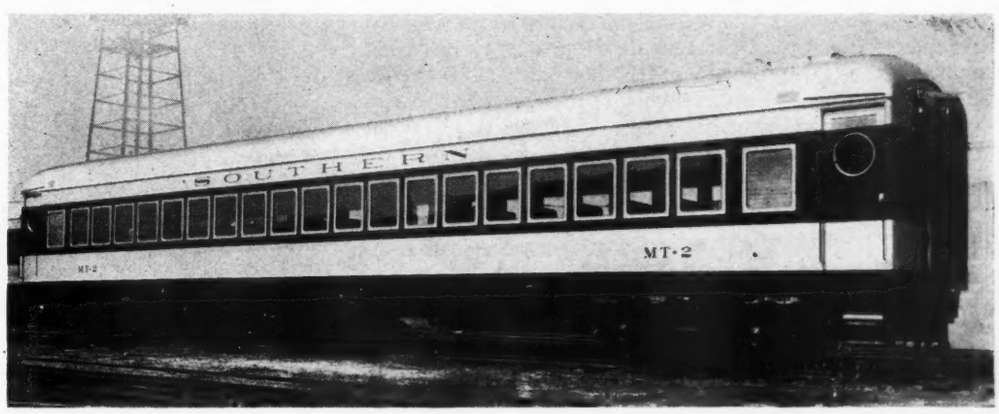
Six Coaches of This Design Were Built for the Delaware & Hudson by the American Car and Foundry Co. Light Weight 112,920 Lb.



Stainless Steel 60-Passenger Coach for the Florida East Coast "Henry M. Flagler," Built by Edw. G. Budd Manufacturing Company. Light Weight 105,750 Lb.



One of Five Aluminum-Alloy Dining Cars Built for the Pennsylvania by Pullman-Standard Car Mfg. Co., Light Weight 113,300 Lb.



One of Four Coaches for Use in Motor Train Service on the Southern. Built by the St. Louis Car Company

Canada

Purchaser	No.	Class	Length Ft.	Length In.	Seating Capacity	Weight	Date of Order	Date of Delivery	Builder
Canadian National	5	Mail & Exp.	73	6	..	151,700	March	July	Can. Car & Fdy.
	10	Baggage	73	6	..	143,500	March	June-July	Can. Car & Fdy.
	50	Box-Bag.	40	8¼	..	48,200	March	June	Can. Car & Fdy.
Canadian Pacific	10	Mail & Exp.	73	10½	..	.....	October	April, '40	National Steel

Canada—Export

Purchaser	No.	Class	Length Ft.	Length In.	Seating Capacity	Weight	Date of Order	Date of Delivery	Builder
Trinidad Government	4	1st & 3rd Cl. Cch.	64	3	..	64,200	August	November	Can. Car & Fdy.
	8	3rd Cl. Coach	64	3	..	62,850	August	November	Can. Car & Fdy.

Rail-Motor Cars

For Service in the United States

Road	No.	Type of Power Plant	Horse-Power	Seating Capacity	Length of Bagg. Compt. Ft.	Length of Bagg. Compt. In.	Weight	Builder
Gulf Coast Lines	1	Gasoline	101	..	17	6	11,800	Evans Products Co.
New York, Susquehanna & Western	2	Oil Engine	275	80	..	..	68,000	A. C. F.-Waukesha-Hesselman

Electrical Benchmarks

(*Continued from page 28*)

each of its three passenger-carrying cars. They consist of 69 hp. Diesel engines, direct-connected to 30-kw. generators, mounted under the car. They supply heating, cooling, lighting and all auxiliary requirements, making each car a completely independent unit. Heat is derived both from the generator output and the engine cooling water.

Propane-fueled engines driving 7½ kw. electric generators are now used on the North Western's "400", on the most recently equipped Rock Island "Rockets" and on a number of private cars to furnish individual electric power supply. Identical 20-hp. engines drive compressors for air conditioning, the two units meeting all requirements except heating.

Train Communication Systems

During the year reports were made available covering tests on three types of communication systems, for use between head and rear ends of long freight trains and between trains on adjacent tracks and wayside points. One of these systems employs earth currents, another consists of a short-wave radio system and the third operates through the track rails shunted through an impedence coupling by a wayside wire. All are capable of carrying clear telephonic communication. (Report of Committee on Radio and Communication Systems, Electrical Section, Mechanical Division V, A. A. R., 1939).

Transmissions for Diesel Locomotives

Interest has been shown in hydraulic transmissions, and one of the several recently developed types has been applied to a 70-ton, 400-hp. Diesel-powered switcher and to a 44-ton, 340-hp. switcher. The electrical manufacturers have announced that new, inexpensive electrical transmission have made it possible to meet competition successfully with mechanical drive for small Diesel locomotives.

Air Conditioning

The air conditioning of passenger cars continues at a somewhat lower rate than in recent years, most of the applications being made to new equipment.

A new field was opened by the Union Pacific, when it air-conditioned its 12-story general office building, at Omaha, Neb. (*Railway Age,* July 29, 1939, page 170).

Electric Brake Control and Electric Pumping

During the past year two types of automatic electric-brake control were introduced. One was tested on the Great Northern and the Chicago Burlington & Quincy, and the other was installed to control the disc-type brakes on the Burlington's "General Pershing". Both serve to prevent slid-flat wheels and to increase braking efficiency. (*Railway Age,* February 4, 1939, page 232—*Railway Age,* April 29, 1939, page 727).

The first installation involving the use of vertical turbine pumps for railroad fire service was applied by the Chicago, Rock Island & Pacific for the protection of its terminal grain elevators C and D at 93rd street, and Harbor avenue, in South Chicago, Ill. A fall in pressure on one pump, due to increased demand, automatically causes the other to act.

* * *

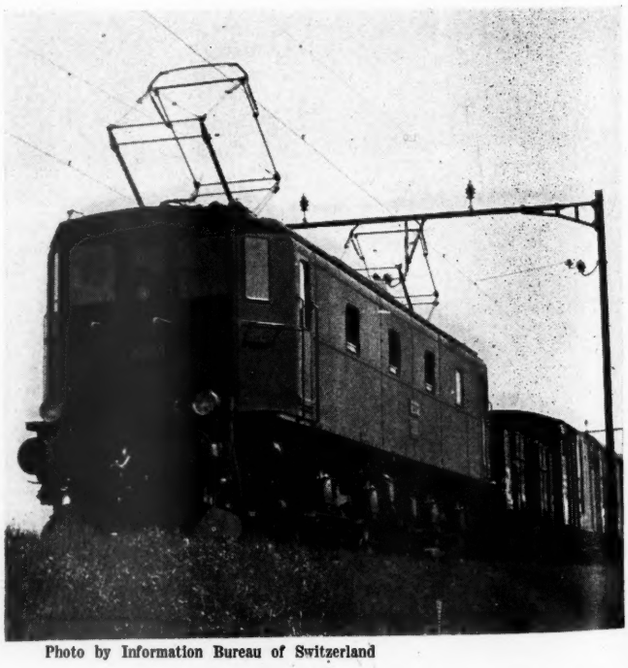
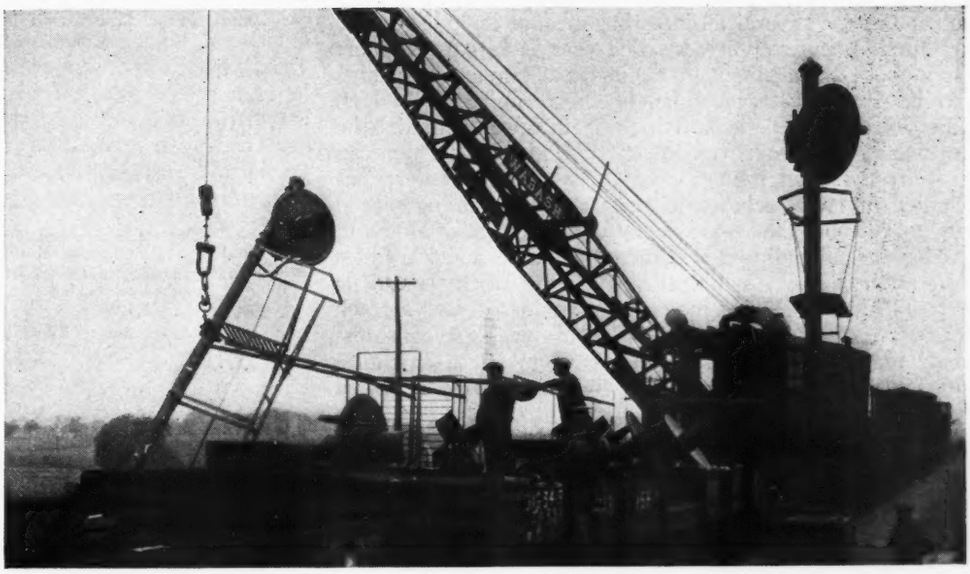


Photo by Information Bureau of Switzerland

An Electrically-Hauled Freight on the Swiss Federal System



In Modern Signaling Construction Practices, the Cases or Boards are Wired at Headquarters, and Signals are Assembled and Mounted as Complete Units

Signaling Construction Increases

Decrease in interlocking offset by growth in crossing protection and automatic block—Good prospects for 1940

By John H. Dunn

Signaling Editor

SIGNALING construction in the United States and Canada during 1939 exceeded that for the preceding year by a small margin, a total of 5,017 units of equipment being installed as compared with 4,940 in 1938. The 1939 totals exceed those for the years 1932 to 1936 inclusive, the low in recent years being 2,837 units in 1932, while the peak was 17,499 units in 1930.

The major decrease for 1939 was in interlockings. Several large plants, such as the two on the San Francisco-Oakland bridge project and the two at the Los Angeles Union Passenger Terminal, were practically completed in 1938 and were included in the totals for that year. No large interlockings of comparable size were constructed during 1939. To offset this reduction, increases were shown in automatic block signaling, highway crossing protection, spring switches and automatic interlockings.

From the standpoint of the manufacturer of signaling equipment, business was exceedingly dull during the early months of 1939, but increased rapidly during the remainder of the year. Field construction was started on several large projects of automatic block signaling and cab signaling, such as on the Norfolk & Western and the Pennsylvania, which are not yet completed. Also during the last six months of the year, orders were placed for considerable equipment to be used for replacements. Therefore, considering totals, a great deal more signaling apparatus was manufactured in 1939 than in 1938. Furthermore, a considerable volume of new signaling is planned and authorized for 1940. This includes several extensive centralized traffic control projects, new automatic signaling on extended mileages and a few sizable interlockings. Prospects, therefore, seem to be favorable for a decided increase in signaling facilities to be completed and placed in service during 1940.

Automatic Block Increased

During 1939, automatic block signaling was placed in service on 421 miles of single track, 141.6 miles of double track and 6.5 miles of three track lines, totaling 723.7 track miles, an increase of 148.7 miles over that for the previous year. A total of 879 automatic signals were installed in 1939 as compared with 674 in 1938. In addition, some large projects have been under con-

Comparison of Annual Signal Construction

Type of Installation	Number of Units 1938	Number of Units 1939
AUTOMATIC BLOCK SIGNALS	674	879
HIGHWAY CROSSING SIGNALS	1,995	2,385
INTERLOCKINGS		
Signals and switches new plants	1,175	396†
Signals and switches added at rebuilt plants	185	545
Signals at automatic plants	41	96
REMOTE AND CENTRALIZED TRAFFIC CONTROL		
Signals and switches	579	...
CENTRALIZED TRAFFIC CONTROL		
Signals and switches	...	160
SPRING SWITCHES		
Spring mechanisms	132	222
Mechanical facing-point locks	20	104
Signals installed at spring switches	95	228
CAR RETARDERS	44	2
Totals	4,940	5,017

† Figure for 1939 includes units in remotely controlled plants which for 1938 were included with centralized traffic control.

struction for several months, but are not included in the totals as being completed. The year 1939 gave support to a previous statement that considerable mileage remains to be signaled—approximately 6,000 miles—on which the volume of traffic and high train speeds justify the protection and improvement in train operation which can be effected by signaling. Examples of such projects installed in 1939 include automatic block signaling placed in service on the Wabash between Foristell, Mo. and Salisbury, including 111.5 miles of single and 7.0 miles of double track, while the Chicago, Rock Island & Pacific installed signaling on 72.8 miles of single track between Allerton, Iowa and Des Moines. A considerable number of projects, ranging from 20 to 35 miles, also are shown in the tables, including 31.7 miles of single track on the Baltimore & Ohio, 20 miles of double track on the Chesapeake & Ohio, 21.6 of single track on the Missouri Pacific and 31.5 miles of single track on the St. Louis-San Francisco.

On account of the introduction of new types of interlocking control systems, a statement of the number of

The Interlocking on the St. Louis Municipal Bridge was the Largest Project of this Character Installed in 1939

levers has lost significance as a measure of the equipment installed in a plant. For example, the operation of two buttons now controls the signals and switches in an entire route. When compiling the data for the route-control, entrance-exit, push-button plants installed

Interlockings Constructed in 1939, Including Also Remotely Controlled Plants

Road	Location and Type of Control Machine	Manufacturer	No. of Signal Operating Units	No. of Switches and Derails Operated by: Electric Switch Mach.	Electro Pneu.	Mechanical Connections
Manual control using levers with mechanical locking						
	NEW					
A. C. L.	Savannah, Ga.	Union	12	..	..	..
B. & O.	Moundville, W. Va. (TL)	Union	4	..	..	..
C. N.	Gamebridge, Ont.	..	2	..	..	2
G. T. W.	Ashburn, Ill. (TL)	Union	14	..	..	..
C. P.	Preston, Ont. (SW TL Sig P. B.)	Union	4	1	..	..
C. & W. I.	Hayford, Ill. (TL)	Union	14	..	..	..
H. & M.	New York, N. Y.	Union	10	..	9	..
Penna.	Flushing, N. Y. (TL)	Union	12	..	11	..
	L. I. City, N. Y.	Union	13	..	6	..

Interlockings Constructed in 1939, Including Also Remotely Controlled Plants—(Cont'd)

Road	Location and Type of Control Machine	Manufacturer	No. of Signal Operating Units	No. of Switches and Derails Operated by: Electric Switch Mach.	Electro Pneu.	Mechanical Connections
Manual control using levers with mechanical locking						
	NEW					
Sou.	John Sevier, Tenn. (TL)	G.R.S.	4	1	..	..
	Beamon, Va.	..	4	..	..	2
			93	2	26	4
	REBUILT					
A. C. L.	Falling Creek, Va.†	Union	13	..	..	6
	Telfair Jct., Ga.†	Union	2	..	..	..
C. M. St. P. & P.	Chicago†	Union	..	..	10	..
	Milwaukee, Wis.†	Union	..	..	..	2
D. T. & I.	Detroit, Mich.† (TL)	Union	2	4	..	..
L. V.	P. & L. Jct., N. Y.†	G.R.S.	12	..	..	10
L. & N.	Spottsville, Ky.†	G.R.S.	4	2	..	..
N. Y. C. C. C. & St. L.	Grafton, Ohio†	G.R.S.	13	..	..	10
	Ashmore, Ill.†	Union	14	8	..	..
	Cold Springs, Ohio†	G.R.S.	32	2	..	..
	Glover, Ind.†	Union	10	2	..	..
	Bellefontaine, Ohio†	G.R.S.	22	27	..	..
Penna.	Philadelphia, Pa.†	Union	5	..	5	..
	Rockville, Pa.†	Union	9	..	9	..
	Tyrone, Pa.† (1)	Union	..	..	..	..
S. A. L.	Mulberry, Fla.† (2)	Union	4	..	..	2
	Sanford, N. C.† (2)	Union	..	..	..	2
	Darlington, S. C.†	Union	6	..	..	2
S. P.	West Oakland, Cal.†	Union	49	..	24	..
	Fruitvale, Cal.†	Union	47	..	47	..
	Alameda, Cal.†	Union	15	14	..	..
	Los Angeles, Cal.†	G.R.S.	25	18	..	..
B. T. N. Y. C.	New York†	G.R.S.	12	..	..	..
	New York†	G.R.S.	19	8	..	..
			315	85	95	34
Manual control using miniature levers or push buttons with no mechanical locking but with circuit interlocking						
	NEW					
B. & M.	Emery, N. H.	Union	8	1	..	..
	Portsmouth, N. H.	Union	5	1	..	..
C. N.	St. Johns, Que.	Union	5	3	..	..
C. & O.	Lindsay, Va.	Union	19	4	..	..
C. M. St. P. & P.	Sturtevant, Wis.	Union	11	4	..	..
Erie	Gulf Summit, N. Y.	Union	4	2	..	..
	Callicoon, N. Y.	Union	4	1	..	..
	Everett, Wash.	G.R.S.	7	2	..	..
	New Rockford, N. D.	G.R.S.	4	1	..	..
K. S.	Oakland, Cal.	G.R.S.	6	3	..	..
L. & N.	Memphis Jct., Ky.	G.R.S.	8	1	..	..
M. P.	Cole Jct., Mo.	G.R.S.	4	4	..	..
N. Y. C. & St. L.	Pomfret, N. Y.	Union	4	1	..	..
	North East, Pa.	Union	4	1	..	..
Penna.	Columbus, Ohio	Union	1	..	21	..
St. L.	St. Louis Mun. Bridge	G.R.S.	59	45	..	..
U. P.	Los Angeles, Cal.	G.R.S.	9	4	..	..
			162	78	21	..
	REBUILT					
Penna.	Bloomville, Ohio†	Union	4	1	..	..
	Bernice, Ill.†	Union	7	3	..	..
	Brownstown, Ill.†	Union	5	4	..	..
			16	8	..	..
	AUTOMATIC INTERLOCKINGS					
C. R. I. & P.	Medora, Kan.	Union	5	..	..	..
C. & S.	Walsenburg, Colo.	G.R.S.	4	..	..	..
G. N.	Bluestem, Wash.	G.R.S.	4	1	..	..
	Lamona, Wash.	G.R.S.	4	1	..	..
	Minneapolis, Minn.	G.R.S.	4	4(3)	..	..
G. M. & N.	Jackson, Tenn.	Union	9	..	..	..
M. & St. L.	Chaska, Minn.	..	5	..	..	..
	Montgomery, Minn.	..	4	..	..	..
	Perry, Minn.	..	4	..	..	..
M. S. P. S. S. M.	Medina Jct., Wis.	..	8	..	..	..
M. P.	Presley Jct., Ark.	G.R.S.	8	..	..	..
N. Y. C.	Cecile Jct., Que.	G.R.S.	10	..	..	..
St. L.-S. F.	Liberal, Mo.	Union	7	..	..	..
S. A. L.	Mullins, S. C.	Union	5	..	..	..
	Dover, S. C.	Union	4	..	..	..
	Hawthorne, Fla.	Union	..	..	..	..
U. P.	Hanover, Kan.	Union	7	..	..	..
	Salt Lake City, Utah	Union	4	..	..	..
			96	6	..	..

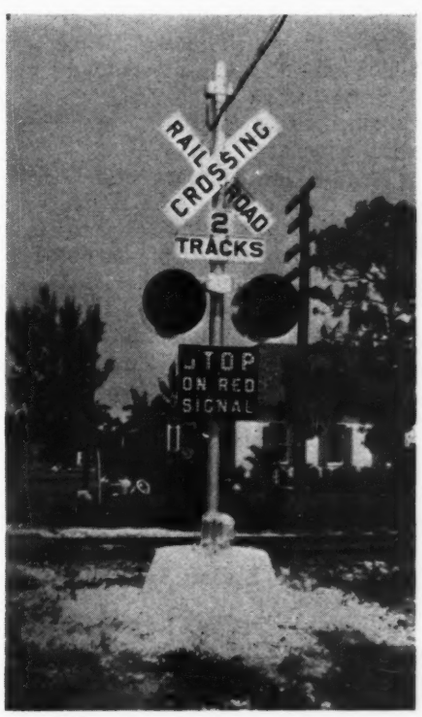
TL Table levers with mechanical locking.
† Rebuilt, listing units added.
(1) Control transferred, no signals or switches added.
(2) Hand-operated mechanical lever with electric locks controls signals.
(3) Smash boards.

in 1938, it was necessary to use the numbers of operative signal units and switch machines involved. As shown in the accompanying table, the data for the remainder of the interlockings installed in 1938 have been converted to this new basis, and the data for the plants installed in 1939 were collected and compiled on the new basis of operative signal units and power switch machines.

Headings in the table separate manually-controlled plants from those automatically controlled. Under the manually-controlled plants, headings are so given as to segregate the plants using control machines with mechanical locking from those using miniature levers or buttons with no mechanical locking but with interlocking accomplished by interconnections of circuits. The table includes remotely-controlled as well as locally-controlled plants, whereas in previous statistical articles remotely-controlled plants have been listed with centralized traffic control. By means of this consolidation of data, one table now includes all projects in which train movements are governed by interlocking rules.

A comparison of the data shows that in 1939 only 11 new plants included mechanical locking between levers,

A New High Total of 291 Gates Were Installed in 1939



A Total of 1,603 Flashing - Light Crossing Signals Were Installed in 1939

Automatic Block Signals Completed During 1939

Railroad	Location	Miles of Road	No. of Signals	Manufacturer	Power Supply
A. T. & S. F.	Corona, Cal., to Scully	6.5 s	12 c	Union	ACF*
B. & O.	Olney, Ill., to Vincennes, Ind.	31.7 s	68 c	G.R.S.	ACF
B. & G.	Dry Fork Station, Utah.	..	1 c	G.R.S.	ACF
B. & M.	Wamesit, Mass., to Tewksbury	3.8 s	..	..	Prim.
	Emery, N. H.	2.5 s	1 c	Union	Prim.
	Emery, N. H., to Portsmouth	1.0 d	1 c	Union	ACF
	Emery (Portsmouth Branch), N. H.	0.2 s	..	..	..
	Windsor, Vt., to White River Jct.	13.4 s	12 c	G.R.S.	Prim.
C. N.	Rimouski, P. Q.	0.56 s	1 s	G.R.S.	Prim.
C. & O.	Buchanan, Va., to Springwood	5.0 d	3 c	Union	ACF*
	Barboursville, W. Va., to Ranger	11.0 s 20.0 d	30 c	Union	ACF
C. & I. M.	Petersburg, Ill., to Hill Top	1.55 s	2 c	Union	ACF
C. & N. W.	Blodgett, Ill., to Skokie	5.3 d	10 c	G.R.S.	ACP
	Upton, Ill., to Wis.-Ill. State Line	12.0 d	14 c	G.R.S.	ACP
	Wis.-Ill. State Line, to Rawson, Wis.	24.5 d	24 c	G.R.S.	ACP
	Woodstock M.P. 52 Ill., to Harvard M.P. 58	5.5 d	7 s	G.R.S.	ACP
C. M. St P. & P.	Marquette, Iowa, to Monona	13.5 s	20 c	Union	ACP
C. R. I. & P.	El Reno, Okla., to Oklahoma City	1.0 d 21.8 s	28 c	Union	ACF*
	Allerton, Iowa, to Des Moines	72.8 s	94 c	Union	ACF*
H. & M.	New York City	..	16 c	G.R.S.	AC
L. V.	P. & L. Jct., N. Y., to Stafford	3.35 d	4 c	G.R.S.	ACF
	Port Bowkley, Pa., to Plainsville	1.98 d	2 c	G.R.S.	ACF
	Pittston Jct., Pa., to Avoca	2.76 d	3 c	G.R.S.	ACF
L. & N.	South Patio, Ky., to Roker	2.5 s	4 s	G.R.S.	ACF*
	Calla, Ky., to Irvine	2.9 s	7 s	G.R.S.	ACF*
M. K. T.	Denison (Reddam), Texas	..	1 s	Union	Prim.
M. P.	Monroe, La., to Riverton	21.6 s	34 c	G.R.S.	ACF
N. Y. C. B. & A.	Charlton, Mass., to West Warren	10.2 d 6.5 t	31 c	G.R.S.	ACF
N. & W.	Weller Yard, Va., to Home Creek	7.3 s	12 c	Union	ACF
	Auville Yard, W. Va., to Amonate	31.5 s	74 c	Union	ACF
P. E.	North Hollywood, Cal., to Kester	3.0 s	8 c	Union	ACF-AC
	Maxson, Cal., to Al Barnes	0.5 s	4 c	Union	ACF-AC
Penna.	Wampum, Pa., to New Brighton	12.5 d	12 c	Union	ACF
St. Louis	St. Louis Municipal Bridge	4.0 d	42 c	G.R.S.	ACF
St. L.-S. F.	Bay, Ark., to Turrell	31.5 s	50 s	Union	Prim.
	Sapulka, Okla., to Preston	25.1 s	38 s	Union	Prim.
St. L.-S. W.	Camden, Ark., to Herbert	4.3 s	8 c	Union	ACF*
U. P.	Cheyenne, Wyo., to Buford	25.50 d	39 c	Union	ACF
Wabash	Foristell, Mo., to Moberly	97.50 s	125 c	..	..
	Moberly, Mo., to Huntsville	7.0 d	13 c	..	..
	Huntsville, Mo., to Salisbury	14.0 s	24 c	..	..
	Totals	421.01 s 141.59 d 6.5 t	771 c 108 s		
	Grand Totals	569.10	879		

Legend: In "Miles of Road" column: s=Single track, d=Double track, t=Triple tracks.
In "Number of Signals" column: s=Semaphore, c=Color-light.
In "Power Supply" column: A-C.=Alternating current, ACF=A-C. Floating, ACF*=A-C. Floating with primary battery for track circuits, ACP=A-C. Primary, Prim.=Primary.

as compared with 17 plants using non-interlocked miniature levers or push buttons, the interlocking being accomplished by interconnection of circuits, ordinarily known as all-relay plants. The project on the Pennsylvania at Columbus, Ohio, including 1 signal and 30 switches, represents the installation of power switch machines in a gravity type classification yard. The most extensive interlocking project installed in 1939 included interlocking and signaling on the double-track line across the Municipal Bridge at St. Louis, Mo., on which train movements in either direction on both tracks are directed by signal indication, and involves 59 operative interlocking signal units, 42 automatic signals and 45 power switches. A total of 24 plants using mechanical locking were rebuilt during 1939, requiring the addition of 545 signal and switch units. Three plants were rebuilt in which non-interlocked levers were used, totaling 24 units.

Some of the interlocking installations are not easily classified as to types of control. For example, in the installation at Chaska, Minn., a crossing gate normally set across the Minneapolis & St. Louis controls signals on the crossing line. In projects installed by the Seaboard Air Line at Mulberry, Fla., and Sanford, N. C., to replace mechanical plants, manually-operated switch-and-lock movements with electric locks control the signals on the two lines which cross at those locations.

A total of 18 automatic interlockings were installed in 1939, including 96 operative signal units and 6 interlocked switches, as compared with 6 plants, including 41 signal units, in 1938. Many of these new automatic plants replace manually-controlled mechanical interlockings. The automatically-controlled plants on the Great Northern, which include automatically-controlled, power-operated switches, are of special interest.

Centralized Traffic Control Installations Completed in 1939

Railroad	Location	Miles of Road	Manufacturer	Direct Wire or Coded Control	No. of Levers: Desk Type	No. of Levers: C.T.C. Type Power Oper. Switches	No. of Signals Controlled
B. & M.	No. Cambridge, Mass. to Hill Crossing	1.0 s	G.R.S.	C	..	3	.. 4
C. & O.	WH Cabin, W. Va. to Ranger	11.0 s	Union	DW-C	..	4	2 6
C. R. I. & P.	Lock Springs, Mo. to Polo	25.0 s	Union	C	..	15	7 38
Erie	Gulf Summit, N. Y. to Lanesboro, Pa.	6.7 d	Union	C	..	1	.. 2
M. P.	No. Little Rock, Ark.	..	G.R.S.	..	..	..	1 ..
	Benton, Ark.	..	G.R.S.	..	..	..	3 ..
N. Y. C. B. & A.	Springfield, Mass. to Athol Jct.	2.3 s	G.R.S.	C	..	10	4 10
N. Y. C. & St. L.	BM, N. Y. to Brocton	1.1 s	..	DW	4	..	1 4
N. Y. O. & W.	East Branch, N. Y. to Cadosia	8.7 s	Union	DW	1	..	1 3
	High View Tunnel, N. Y. to Mamakating	1.6 s	Union	DW	1	..	2 2
N. & W.	Home Creek, Va. to Kelsa	11.4 s	Union	C	..	30	17 53
		62.1 s 6.7 d			6	63	38 122

Legend: In "Miles of Road" column: s=Single track, d=Double track.

Spring Switches Increase

Spring mechanisms for the operation of switches were installed at 222 locations during 1939, an increase of 90 over the previous year. Of the spring switches installed in 1939, 165 were at ends of passing tracks, 28 at ends of double track, 7 at junctions and 22 on yard tracks. Mechanical facing-point locks, which give protection equivalent to interlocking for main line train movements, were installed on 104 spring switch installations during 1939, as compared with only 20 during the year previous. As a part of spring switch projects completed in 1939, a total of 228 signals, including 146 dwarfs and 82 high signals, were installed, as compared with a total of 95 signals in the previous year.

Centralized Traffic Control

Centralized traffic control was installed during 1939 on 62.1 miles of single track and 6.7 miles of double track, involving 69 control levers, 38 power switches and 122 controlled signals. The totals represent decided reductions from those for the previous year. The Rock Island installed C. T. C. on 25 miles of single track between Lock Springs, Mo. and Polo, while the Chesapeake & Ohio and the Norfolk & Western each made an installation of an 11-mile territory. The remainder of the projects were on comparatively short mileages.

Spring Switches Installed During 1939

Railroad	Total No. of Spring Switches Installed	Classification as to Application: End of Passing Track	End of Double Track	Junction	Yard Track	Total No. Equipped with Facing Point Lock	Signal Protection: High Signals	Dwarf Signals
A. T. & S. F.	10	6	..	2	2	..	18	8
A. C. L.	9	8	..	..	1	9	..	1
B. & O.	1	..	1	..	..	..	2	..
C. N.	2	1	1	..	..	..	1	2
C. of G.	1	1	..	..	..	1	..	1
C. & O.	9	8	1	..	..	4	6	8
C. & L. M.	2	2	..	..	..	..	..	2
C. & N. W.	1	..	..	..	1	..	..	..
C. & W. I.	1	..	..	..	1	..	..	..
C. B. & Q.	17	17	..	..	..	17	..	..
C. M. St. P. & P.	12	6	2	2	2	8	14	8
C. R. I. & P.	14	12	..	..	2	13	1	2
C. & S.	2	..	1	1	..	..	1	3
D. & H.	1	1	..	..	..	..	2	1
D. & R. G. W.	4	3	..	..	1	3	7	1
Erie	2	1	..	..	1	..	..	2
G. N.	1	..	..	..	1	1	2	..
I. C.	4	1	2	1	..	..	8	3
Y. & M. V.	1	..	1	..	..	..	4	..
L. V.	2	2	..	..	..	..	2	2
L. & N.	11	9	2	..	..	..	20	4
M. & St. L.	1	1	..	..	..	1	2	1
M. P.	9	5	1	..	3	..	10	10
N. C. & St. L.	1	..	..	..	1	..	..	..
N. Y. C.	1	..	1	..	..	1	1	..
B. & A.	2	..	2	..	..	..	..	2
N. Y. C. & St. L.	4	4	..	..	..	4	..	2
N. Y. O. & W.	1	..	1	..	..	1	2	..
N. & W.	8	7	1	..	..	2	13	6
P. E.	2	..	2	..	..	..	2	..
Penna.	7	2	3	..	2	7	8	1
P. M.	4	1	2	..	1	4	..	1
St. L.-S. F.	2	1	..	..	1	1	2	..
St. L.-S. W.	4	3	1	..	..	4	3	..
S. A. L.	22	21	..	..	1	22	1	1
Southern	22	22	..	..	..	..	..	..
C. N. O. & T. P.	2	2	..	..	..	..	..	..
A. G. S.	4	4	..	..	..	..	..	..
N. O. & N. E.	2	2	..	..	..	..	..	..
T. & P.	8	7	..	..	1	..	7	7
T. & N. O.	3	3	..	..	..	..	4	..
U. P.	3	2	..	1	..	..	..	3
Virginian	2	..	2	..	..	..	2	..
W. & L. E.	1	..	1	..	..	1	1	..
Totals	222	165	28	7	22	104	146	82

Highway Crossing Protection Increased

Automatically-controlled, highway-railroad crossing protection was installed at 1,019 crossings, using 2,385 units of protection equipment in 1939, as compared with

897 crossings and 1,995 units in the year previous. A unit includes a complete flashing-light signal, with back-to-back mounting, a wig-wag, a gate or a barrier. The increasing preference for flashing-light signals as compared with wig-wags is shown by the fact that 1,603 flashing-light signals were installed, as compared with only 168 wig-wags. Of the wig-wags installed, 54 were in Utah, 31 in California and 25 in Wisconsin. The vast majority of the flashing-light signals installed in 1939 were equipped with button-type reflector signs reading: "Stop on Red Signal." In a few states, the automatically-controlled illuminated "STOP" signs were installed on a total of 184 signals, including 71 in Utah, 25 in Texas and 16 in Missouri. Signals including a rotating disc sign reading "STOP," together with flashing lights, are preferred in some states, a total of 312 such signals being installed in 1939; 136 in Iowa, 59 in Minnesota, 44 in South Dakota and 41 in Wisconsin.

The widespread adoption of automatically-controlled gates as an effective means of crossing protection is indicated by the installation of 291 gates in 1939, as compared with 138 in the year previous. On the vast majority of these projects, short-arm gates, which obstruct only the traffic lane approaching the tracks, are used in conjunction with standard flashing-light signals. Barriers, of the type which rise out of the surface of the highway, were installed at two crossings.

As shown in the table classifying the crossing protec-

Table of Crossing Protection Installed in Different States Separated As to Sources of Funds and Type of Protection

State or Province	No. of Crossings	Sources of Funds: Railroad	Federal	State	City-County Private†	Total Protection Units	No. of Wig-Wag Signals	No. of Flashing-Light Signals	No. of Rotating Disk Stop Sign Signals with Flashing Lights	No. of Traffic Type Stop-and-Go Crossing Signals	Gates Barriers‡
Ala.	2	..	2	..	..	4	..	4	..	..	..
Ariz.	2	..	2	..	..	6	..	6	..	..	..
Ark.	2	1	1	..	..	4	..	2	..	..	..
								2*			
Cal.	24	6.5	8	.50	9	47	31	16	..	..	..
Colo.	26	1	25	..	..	59	..	55	..	..	2
								2*			
Conn.	2	2	..	..	..	4	..	4	..	..	..
Del.	3	..	3	..	..	6	..	4	..	..	2‡
Fla.	15	2	13	..	..	38	..	38	..	..	..
Ga.	29	5	24	..	..	72	..	60	..	..	..
								12*			
Ill.	108	32.80	49.75	19.20	6.25	262	2	179	2	..	79
Ind.	57	26	28	3	..	173	..	135	..	..	38
Iowa	109	2	85	22	..	281	..	63	136	..	82
Kan.	21	14	4	3	..	46	1	43	..	..	2
Ky.	45	19	26	..	..	128	..	84	..	..	44
La.	10	9	1	..	..	24	..	16	..	..	4
								4*			
Md.	3	1	2	..	..	9	4	3	..	..	2‡
Mass.	8	8	..	..	..	21	..	21	..	..	..
Mich.	22	8.5	3	6	4.5	48	..	40	..	2	4
								2*			
Minn.	26	7	17	2	..	59	..	..	59	..	..
Miss.	6	..	3	3	..	13	..	10	..	..	..
								3*			
Mo.	15	13.5	..	1.5	..	32	..	16	..	..	..
								16*			
Neb.	40	10	30	..	..	83	..	63	..	..	8
								12*			
Nev.	13	..	13	..	..	29	..	29	..	..	..
N. H.	2	..	2	..	..	5	..	3	..	..	2
N. J.	8	5.5	2	..	.5	19	..	14	..	1	4
N. M.	4	3	1	..	..	9	..	9	..	..	..
N. Y.	15	13	1	..	1†	32	..	32	..	..	..
N. C.	36	5	31	..	..	90	..	86	..	..	4
N. D.	2	1	1	..	..	4	..	2*	2	..	..
Ohio	56	54	1	1	..	132	..	120	..	4	2
								6*			
Okla.	27	1	1	25	..	56	..	50	..	..	2
								4*			
Pa.	23	13.5	1	8.5	..	56	..	54	..	..	2
R. I.	1	..	..	..	1†	2	..	2	..	..	..
S. C.	6	..	6	..	..	14	..	12	2	..	..
S. D.	22	..	21	1	..	46	..	2	44	..	..
Tenn.	17	5	7	5	..	40	..	26	..	..	8
								6*			
Tex.	35	26	9	..	..	62	10	27	..	..	..
								25*			
Utah	57	..	55	2	..	137	4	12	..	..	..
							50*	71*			
Vt.	6	1	5	..	..	15	..	13	..	..	2
Va.	29	2	27	..	..	64	..	64	..	..	..
Wash.	18	2	4	12	..	36	..	10	26	..	..
W. Va.	2	2	..	..	..	4	..	4	..	..	..
Wis.	34	20	7	7	..	66	25	..	41	..	..
Wyo.	7	..	7	..	..	16	9	7	..	..	..
Alta.	1	.15	.85	..	..	1	1	..	..	..	..
N. B.	2	.60	.80	.60	..	2	2	..	..	..	..
N. S.	2	.60	.80	..	.60	2	2	..	..	..	..
Ont.	12	3.80	3.80	4.20	.20	17	17	..	..	..	..
Que.	7	2.40	2.70	1.90	..	10	7	..	..	..	2
							1*				
Totals	1,019	329.85	537.70	128.40	23.05	2,385	117	1,419	312	7	291
							51*	184*			4‡
							168	1,603			295

† Installation paid for by industries or individuals.
* Wig-Wag Signals or Flashing-light Signals equipped with automatically illuminated "STOP" sign.
‡ Barriers.

tion between the states, protection was installed during 1939 at 109 crossings in Iowa, 108 in Illinois, 57 in Utah and 56 in Ohio. Of the total of 1,019 crossings at which protection was installed during the last year, the railroads paid for 329 projects, the federal government for 537, the states or provinces for 128, counties and cities for 21, and private interests for 2.

Car Retarders and Cab Signaling

Only one installation of car retarders was placed in service during 1939, this project being in a small yard at a coal dock on the Pennsylvania at Sandusky, Ohio, which included 3 signals, 3 power switches, and 2 retarders, totaling 137.5 rail feet of retarder.

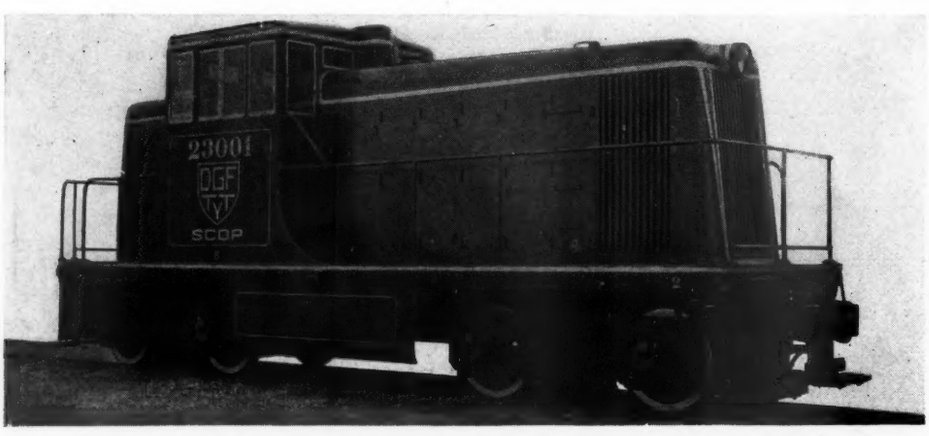
The principal activity in the automatic train control and cab signaling field consisted of the installation of new equipment for locomotives, especially for new light-weight diesel-electric locomotives operating through trains on routes including sections of various roads between New York and various cities in Florida. For example, the Seaboard Air Line and Atlantic Coast Line purchased 15 sets of locomotive equipment for use on their new trains, and other roads purchased a total of 50 locomotive equipments for new installations or replacements. An interesting project of continuously-controlled automatic cab signaling without wayside automatic block signals and without train control is under construction on about 50 miles of double track on the Pennsylvania.

Highway-Railroad Grade Crossing Protection Installed During 1939

Railroad	Number of Crossings	Sources of Funds: Railroad	Federal	State	City-County Private†	Total Protection Units
Alton	15	2.75	7.75	1.75	2.75	31
A. T. & S. F.	53	36	10	..	7	108
A. C. L.	14	..	14	..	..	37
B. & O.	37	24	12	1	..	82
B. & G.	2	..	..	2	..	4
B. & L. E.	1	1	..	..	..	2
B. & M.	6	3	2	..	1†	15
C. N.	14	4.60	4.80	4	.60	18
W. D. & P.	4	..	4	..	..	8
G. T. W.	6	1	4	..	1	16
C. P.	8	2.15	3.65	2	.20	11
C. R. of N. J.	1	1	..	..	..	5
C. of G.	2	1	1	..	..	5
C. V.	5	1	4	..	..	13
C. & O.	19	8	11	..	..	48
C. & E. I.	7	5	2	..	..	30
C. & I. M.	2	..	2	..	..	4
C. & N. W.	25	5	20	..	..	66
C. & W. I.	1	.50	..	..	.50	4
C. B. & Q.	59	5.50	53	.50	..	139
C. I. & L.	6	..	6	..	..	17
C. M. St. P. & P.	78	33	..	42.50	2.50	187
C. R. I. & P.	49	2	43	4	..	102
C. St. P. M. & O.	18	1	17	..	..	42
C. S. S. & S. B.	9	8	1	..	..	22
C. & S.	7	..	7	..	..	18
D. & H.	4	4	..	..	..	9
D. L. & W.	4	4	..	..	..	11
D. & R. G.	4	1	3	..	..	8
D. T. & I.	1	1	..	..	..	2
Erie	13	11	1	1	..	30
F. E. C.	10	1	9	..	..	27
G. N.	14	1	13	..	..	28
G. M. & N.	8	2	6	..	..	16
I. C.	19	3.55	..	15.45	..	60
Y. & M. V.	2	1	..	1	..	6
I. T.	3	..	2	1	..	7
I. U.	1	1	..	..	..	4
Indiana	1	..	1	..	..	2
K. & I. T.	8	8	..	..	..	16
K. C. S.	1	1	..	..	..	2
L. & N. E.	1	.50	..	.50	..	3
L. V.	4	2	1	.50	.50	8
L. & N.	32	6	26	..	..	107
L. & A.	8	8	..	..	..	16
Me. C.	1	..	1	..	..	2
M. & St. L.	27	..	27	..	..	54
M. St. P. & S. S. M.	6	..	4	2	..	12
M. P.	13	9	4	..	..	28
M. P. in Neb.	11	10	1	..	..	24
M.-I.	1	1	..	..	..	2
I. G. N.	4	4	..	..	..	8
M. & O.	7	..	..	7	..	18
N. C. & St. L.	15	6	9	..	..	34
N. Y. C.	8	3.50	2.50	2	..	20
C. C. C. & St. L.	14	6	7	1	..	37
P. & E.	1	..	1	..	..	2
M. C.	7	4	..	3	..	19
P. & L. E.	1	..	..	1	..	2
N. Y. C. & St. L.	5	1	4	..	..	12
N. Y. N. H. & H.	9	8	..	..	1†	21
N. & W.	2	1	1	..	..	6
N. S.	19	..	19	..	..	38
N. P.	9	4	5	..	..	18
P. E.	2	.50	..	.50	1	3
Penna.	29	20	6	3	..	73
P. M.	13	6.30	2	.70	4	26
P. & N.	5	..	5	..	..	10
Pull. R. R.	9	..	9	..	..	20
Reading	3	.50	2	.50	..	6
St. L.-S. F.	32	2.50	..	29.50	..	69
St. L.-S. W.	4	4	..	..	..	9
S. A. L.	28	2	26	..	..	67
Southern	16	3	13	..	..	42
A. G. S.	1	..	1	..	..	4
N. O. T.	1	..	1	..	..	4
St. J. R. T.	1	1	..	..	..	2
S. P.	22	1	20	..	1	50
T. & N. O.	10	5	5	..	..	15
T. & P.	5	2	3	..	..	10
U. P.	54	1	53	..	..	131
Wabash	14	6	8	..	..	38
W. M.	3	2	..	1	..	8
W. P.	6	..	6	..	..	12
W. & L. E.	15	14	1	..	..	33
Totals	1,019	329.85	537.70	128.40	23.05	2,385

† Installation paid for by industries or individuals.
* Wig-Wag Signals or Flashing-Light Signals equipped with automatically illuminated "STOP" sign.

* * * *



65-Ton, 500-Hp. Diesel-Electric Switcher for the Mexican Government. For Operation on New Rail Line Between Campeche and Puerto Mexico. Built by General Electric Company and Powered by Cooper Bessemer Diesel Engine

T. & T. Facilities Expanded

Substantial gains made in modernization of communication systems in 1939 — Increases are shown for mileage of road dispatched by telephone, printing telegraph installations and carrier current applications

By E. J. Phillips
Associate Editor

THE telephone and telegraph departments of the railroads showed renewed activity in 1939 in the installation of modern communication facilities to meet today's transportation needs. Extensive additions were made in the field of carrier current; the application of printing telegraph systems continued on a wide scale; substantial increases were made in the miles of road dispatched by telephone as well as in the total mileage of all types of telegraph circuits; long distance telephone circuits increased considerably in number and mileage, and more pole line was installed new or rebuilt in 1939 than in 1938.

That the general level of activity was considerably above that of 1938 is indicated by reports from 115 railroads in the United States and Canada, summarized in Table A. The 9,825 miles of carrier current systems installed in 1939 represent an increase of 262 per cent over the 2,711 miles installed in 1938; the 871 miles of road equipped for telephone train dispatching are 30 per cent in excess of the 670 miles so equipped in 1938; increases of 73 per cent in circuit mileage and 30 per cent in machines are indicated in the rate of application of printing telegraph systems, as compared with 1938; the 9,075 miles of pole line installed new or rebuilt in 1939 represents an increase of 2,999 miles, or 45 per cent, over 1938; and new telegraph circuits installed totaled 11,705 miles in 1939, as compared with 10,561 miles in 1938, an increase of 11 per cent.

Long distance telephone circuits gained 8,410 miles, although this figure is 17 per cent less than the 10,166 miles so equipped in 1938; likewise the mileage of new copper wire installed dropped from 34,981 miles in 1938 to 5,822 in 1939, the 1938 figure having included the cable wire mileage utilized on the Pennsylvania in its Philadelphia-Harrisburg electrification, or approximately 31,145 miles of the 34,981 reported in 1938 for all roads.

Of the total of 9,705 miles of pole line constructed new or rebuilt in 1939, 2,762 miles were railroad owned, 5,376 miles were commercially owned, and 1,567 miles were jointly owned; activity of this type on each of these classes of lines increased 42.9 per cent, 51.3 per cent, and 28.5 per cent, respectively, in 1939, as compared with 1938. Under the classification "railroad owned", the Louisville & Nashville reported 943 miles rebuilt, the Chesapeake & Ohio reported 288 miles new or rebuilt, the Chicago, Burlington & Quincy 282 miles, the Nashville, Chattanooga & St. Louis 196 miles, and the Illinois Central 189 miles. Comparatively long mileages of new or rebuilt commercially owned lines were reported by the Boston & Maine, with 1,051 miles (6 trunk and 28 branch lines damaged by flood and hurricane); the Southern Pacific with 657 miles; the Missouri Pacific, with 567 miles reconstructed or repaired; the Norfolk & Western, with 350 miles reconstructed; and the St. Louis-San Francisco with 331 miles. The figures for jointly owned new or rebuilt pole line included 718 miles by the Canadian National, which owns and operates commercial telegraphs, 287 miles by the Atchison, Topeka & Santa Fe system, and 270 miles by the Union Pacific system.

Table A—Principal Increases in Communication Plant Facilities in the United States and Canada During 1939, as Compared with 1938

	1939	1938
Miles of new or rebuilt pole line:		
Railroad owned	2,762	1,933
Commercially owned	5,376	3,554
Jointly owned	1,567	1,219
Total	9,705	6,706
Miles of new copper wire:		
Railroad owned	3,170	32,837
Commercially owned	2,652	2,144
Total	5,822	34,981
Gross increase in miles of road dispatched by telephone	871	670
Increase in miles of long distance telephone circuits	8,410	10,166
New mileage of telegraph circuits, all types	11,705	10,561
Increase in miles of printing telegraph circuits	6,919	4,007
Number of new printing telegraph machines	92	71
Increase in miles of new carrier-current systems	9,825	2,711

Principal copper wire installations on railroad-owned lines were made by the Canadian National with 531 miles (on the basis of railroad assigned wires); by the St. Louis Southwestern with 406 miles; by the Chicago, Rock Island & Pacific with 330 miles; by the Missouri Pacific system with 315 miles; and by the Chicago, Mil-

waukee, St. Paul & Pacific with 283 miles of copper wire replacing iron wire. Copper wire was installed on commercially-owned lines by the Canadian National on 1,775 miles (on the basis of commercially assigned wires); by the Union Pacific on 225 miles, and by the Illinois Central on 217 miles. Principal copper wire installations are shown in Table B.

Additions to miles of road dispatched by telephone include 203 miles by the St. Louis Southwestern, 165 miles by the Chicago, Rock Island & Pacific, 148 miles by the Denver & Rio Grande Western, and 106 miles by the Canadian National.

Table B—Principal Copper Wire Installations Completed in the United States and Canada During 1939

	Miles of New Copper Wire		
	Railroad Owned	Commercially Owned	Total
Canadian National	531	1,775	2,306
Chicago, Milwaukee, St. Paul & Pacific	283	...	283
Chicago, Rock Island & Pacific	330	...	330
Illinois Central System	...	217	217
Missouri Pacific System	315	...	315
St. Louis Southwestern	406	...	406
Union Pacific System	70	225	295

The Southern Pacific obtained 2,289 miles of long distance telephone circuit by the application of carrier equipment; the Canadian National secured 579 miles on physical circuits and 688 miles on Type H carrier; the Canadian Pacific 1,006 miles on carrier, 74 miles on new wire, and 56 miles by transposing existing wires; the Chicago, Milwaukee, St. Paul & Pacific 1,087 miles by the application of carrier on 421 miles of message circuit and 666 miles of dispatcher telephone circuit; and the Kansas City Southern 990 miles, of which 430 miles was obtained by stringing wire and transposing existing wires and 560 miles by the application of a carrier current system.

Of the 12,545 miles of new telegraph circuits of all types, the Canadian Pacific installed 6,535 miles, the Canadian National 4,182 miles, and the Kansas City Southern 618 miles.

The principal installations of printing telegraph circuits and machines are listed in Table C. The Santa Fe obtained 1,093 miles of printer circuit by converting service on 1,000 miles of existing wire and erecting 93 miles of new wire. The Milwaukee utilized an existing Morse circuit for 706 miles. The Rock Island utilized a wire formerly used in single Morse telegraph circuit. The Denver & Rio Grande Western installed one duplex printer circuit, utilizing six machines, between Denver, Colo., and Grand Junction, a distance of 450 miles, with repeaters at Salida, on a No. 9 galvanized iron wire formerly used in Morse; a single printer circuit between Pueblo, Colo., and Alamosa, a distance of 132 miles, with three machines, was obtained by simplexing a dispatcher's telephone circuit; one single printer circuit was installed between the telegraph and yard offices, 1/8 mile, using one machine at Grand Junction, and a single printer circuit between Salt Lake City, Utah, and Roper, 2.6 miles, was derived from a simplexed pony telephone circuit.

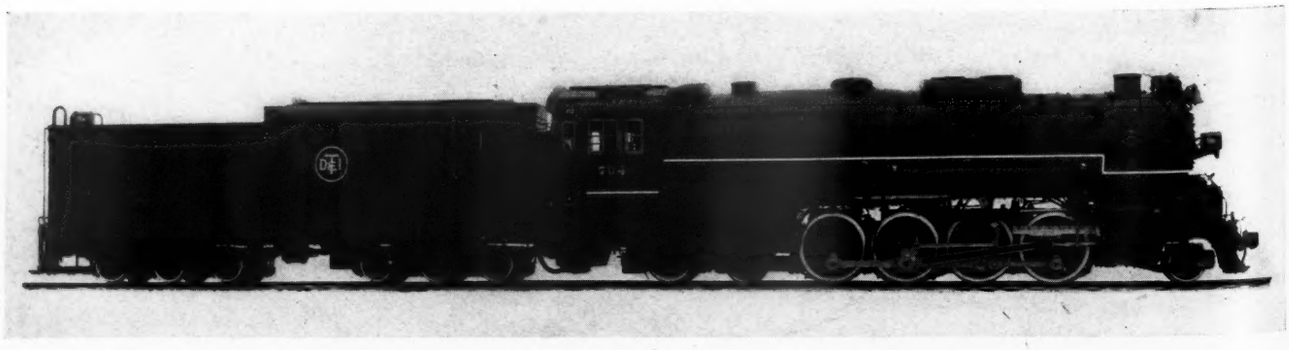
The Erie obtained 638 miles by duplexing an existing single printer circuit, and 180 miles of single printer circuit was obtained by using existing telegraph circuits. The Kansas City Southern re-arranged an existing circuit for either Morse or printer operation, with three machines. The Pennsylvania provided machines at Jersey City, N. J., Elizabeth, and Trenton, and at "NC" New York, involving 59 miles of circuit; 684 circuit miles, utilizing 14 machines were obtained on the Eastern region by utilizing former Morse wires and cable circuits; also, 17 miles of physical circuit and 379 miles of composite, utilizing 4 machines, were provided on the Central region. The Texas and New Orleans changed 233 miles of circuit from Morse to printer, using 11 machines. The Union Pacific simplexed to obtain 874 miles of circuit and provided metallic circuits for 712 miles.

The Southern Pacific installed 2,289 miles of carrier telephone for long distance service. The Kansas City Southern installed a three-channel system to give carrier telephone and carrier telegraph between Kansas City, Mo., and Shreveport, Ala., and carrier telegraph between Kansas City and Heavener, Okla. The Union Pacific provided a three-channel voice carrier between Omaha, Neb., and Ogden, Utah, and single-channel carrier circuits between Omaha and Kansas City, Mo., and between Denver, Colo., and Cheyenne, Wyo. The Chicago, Milwaukee, St. Paul & Pacific installed 1,087 miles of telephone carrier, while the Canadian National installed 684 miles of Type H telephone carrier, and the Canadian Pacific 642 miles of Type B telephone carrier system.

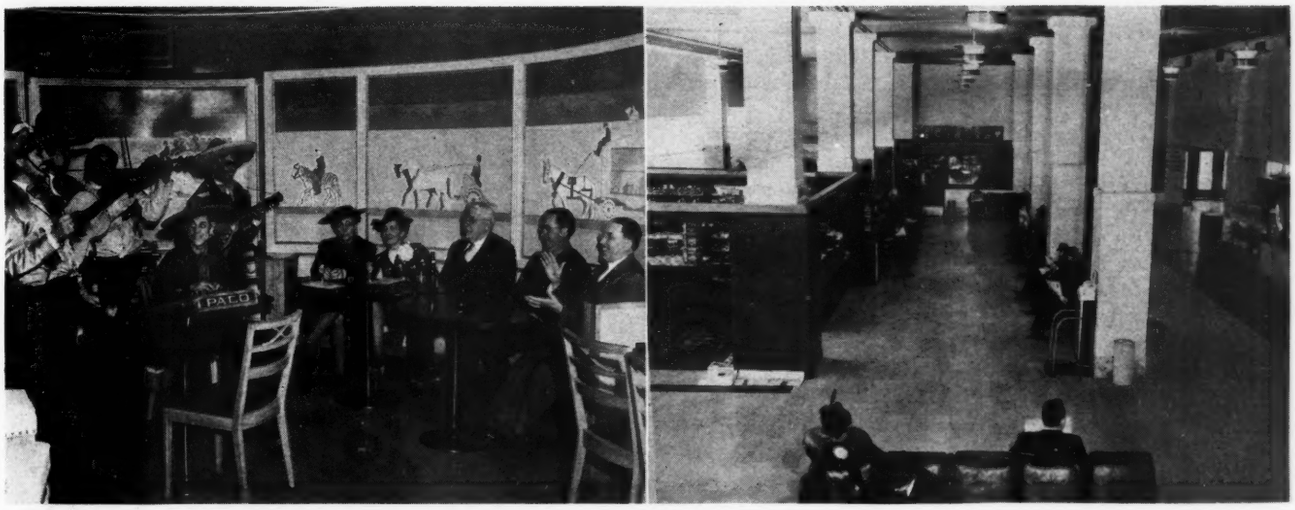
Table C—Principal Printing Telegraph Installations Completed in the United States and Canada During 1939

	Miles of Circuit	Number of Machines
Atchison, Topeka & Santa Fe System	1,093	24
Canadian National	338	2
Chicago, Milwaukee, St. Paul & Pacific	706	1
Chicago, Rock Island & Pacific	266	1
Denver & Rio Grande Western	135	11
Erie	818	4
Kansas City Southern	560	3
Pennsylvania (System)	1,139	22
Texas & New Orleans (S. P.)	233	11
Union Pacific System	1,586	4

* * * *



One of Two Freight Locomotives of 2-8-4 Type Built for the Detroit, Toledo & Ironton by Lima Locomotive Works. Tractive Force 65,800 Lbs.



Railway Bus Stations Were Materially Improved During the Year—Even Night Club Entertainment Is Available for Waiting Passengers

R. R. Motor Vehicle Use Expands

Faster merchandise service brings more rail-highway co-ordination as an operating and traffic aid

By Charles Layng

Motor Transport Editor

THE use of highway vehicles to eliminate stops for fast freight trains has assumed much greater importance during the past year. The faster merchandise trains which are being placed in service throughout the country to meet highway competition are necessarily operated at such high-speed overall schedules that these schedules cannot be made if the trains are burdened with a multiplicity of local stops.

To eliminate this difficulty, more and more railways are adopting the plan of rail-highway co-ordination that has been in effect on certain railways for some years. This consists of operating fast trains between terminals with the minimum of intermediate stops. Certain points are set up as concentration and distribution stations at which the through trains set out and pick up cars of merchandise. The outbound freight is collected from the local stations in certain specified zones by truck and brought to the concentration points for inclusion in through trains. The same trucks then haul the inbound freight, brought to the concentration point by rail, to the local stations in the area to which it is destined.

Many new co-ordinated systems of this sort have been set up during the year, in conjunction with accelerated freight train schedules and many of the existing co-ordinated services of this type have been expanded. The new fast freight schedules are covered in another article in this issue, but among the new co-ordinated systems set up during 1939 were those of the Kansas City Southern, which has paralleled its entire line with truck service designed to serve local stations, and the Illinois Central, which has established an intensive co-ordinated rail-highway service in central and southern Illinois. This latter trucking operation is handled for the railway by the Railway Express Agency, which has been active for some years in promoting the use of its equipment and its wide truck operating experience by the railways for such auxiliary services. The Missouri-Kansas-Texas also established a co-ordinated truck service in Kansas in December.

In addition to the operating advantages accruing from co-ordinated rail-highway service, truck operations in conjunction with fast train schedules possess a distinct traffic advantage for the time of delivery of merchandise freight is reduced, by this means, from 24 to 48 hours, between jobbing centers and consuming points throughout the country.

Legal Technicalities

The Interstate Commerce Commission continued to pursue its somewhat obscure policy during the year in determining whether railways should be permitted to expand their highway operations. Such favorable decisions as it rendered during the year were usually qualified with the phrases "with certain restrictions" and "Commissioner Rogers dissents." These "certain restrictions" presented interesting anomalies in some instances. For example, after mature deliberation over a period of about three years, the Seaboard was finally given permission to operate a co-ordinated service "with certain restrictions." In this case, one of the restrictions was that nothing could be hauled on Seaboard trucks that did not have a rail haul at some time during the through movement.

In actual, practical effect, this restriction prohibited the Seaboard from operating a co-ordinated service on its Jacksonville-River Junction line in northern Florida for a number of l. c. l. shipments are interchanged with coastwise boat lines at Jacksonville; under the restrictions, the Seaboard could not handle such shipments by

truck, but would have to maintain local train service for their delivery. Since the provision of local train service in addition to local truck service would be uneconomical, the effect of this particular ruling was to deprive shippers along this line of the advantages that would have accrued from the co-ordinated service.

A refreshing difference in viewpoint and in realistic approach as between commissions is found in a decision reached by the Railroad Commission of Texas in a case involving the Texas & Pacific Motor Transport Company, a railway subsidiary. Two truck lines already serving the territory between Sherman and Texarkana, where the transport company proposed to operate, protested the application. In granting it, however, the commission pointed out that the railway serves the area and has continued to maintain agents and facilities at each of the 19 towns served, whereas the truckers have but 3 agencies. The commission continued:

"This commission knows that the railroads, because of diversion of tonnage to motor truck, have been required to abandon many stations in small communities in this state and that unless these stations located on the railroads can be used to a greater extent than they have been used and if the process of diverting tonnage continues, a serious question arises as to whether or not their continued maintenance can be justified."

Expanding Truck Lines

In addition to the expansion in railway-owned truck subsidiaries previously mentioned, several other railways have expanded their truck activities. Both the Chicago, Rock Island & Pacific and the St. Louis-San Francisco have acquired new lines and such railroads as the Mobile & Ohio and the Minneapolis & St. Louis have applications pending for the installation of such services. The Southern Pacific has continued the expansion of its large fleet and also has increased the flexibility of its service to a point where it is able to bid on and handle such haulage jobs as moving an entire office, including 250 tons of equipment, from one place to another.

An outstanding technical development during the year was the purchase by the Burlington Transportation Company of a fleet of Diesel-powered trucks, which have now been in successful operation for some months.

Bus Activities

Passenger train operation has also been accelerated during the year and the use of buses to avoid stopping through passenger trains has increased. The use of buses as feeders for the streamlined trains has been responsible for much of this increase. The Twin Cities Zephyrs on the Chicago, Burlington & Quincy, for example, have five connecting bus feeder lines and give certain additional cities the advantage of this high-speed train service. The practice of making train tickets interchangeable on subsidiary bus lines for the benefit of commercial travelers is also on the increase. This has brought many passengers back to the railways, who, because of the curtailment of local train service, were using other agencies of transportation.

Last year marked the completion of the first full year of operation of the unique bus-streamliner-bus co-ordination of the Atchison, Topeka & Santa Fe between San Francisco and Los Angeles. The results indicate a successful season and are worthy of study for possible application of the same principles at other points in the country. The Santa Fe Trail Stages also established overnight buses, equipped with sleeping accommodations, between San Francisco and Los Angeles during the year, with satisfactory results.

After the Interstate Commerce Commission, for somewhat obscure reasons, denied the application of the bus subsidiary of the Chicago, Burlington & Quincy to consolidate with the Interstate Transit Lines, owned by the Union Pacific and the Chicago & North Western, the Burlington Transportation Company purchased a fleet of Diesel-powered buses which have been in successful operation for several months.

One of the major developments of the year in the railway bus field was the number of new stations built. The Santa Fe was particularly active along these lines, as were the other railway bus subsidiaries belonging to the National Trailways. Progress along these lines was also made by such companies as the Pennsylvania Greyhound and the Pacific Greyhound. The old bus station in a corner grocery store or restaurant is fast disappearing. The new stations are modernistic in design, with many improvements for efficient operation and comfort for the passengers, and, since they are designed by railway building engineers in most cases, they present the comforts and conveniences of modern rail terminals. This, coupled with wide advances in air-conditioned buses, in which railway subsidiaries have taken a leading part, and improved riding comfort, is taking railway bus transportation out of the "roughing it" class. A further indication of this trend is the steadily increasing number of all-expense bus tours operated, not only by the larger companies, but by such companies as the Norfolk Southern, with its elaborate program of garden tours throughout the Southeast.

The accompanying list of orders for highway vehicles shows that during 1939 the railroads and their reporting subsidiaries placed orders for a total of 393 motor coaches, 1,638 units of highway freight equipment and 263 automobiles. This compares with 260 motor coaches, 1,647 units of highway freight equipment and 164 automobiles reported as purchased during 1938.

The list of orders, which has been compiled from questionnaire-reports from the railroads and their reporting subsidiaries, is presented with the purpose of indicating the possibilities in, and the trend of, the railroad market for automotive equipment, and no brief is held for its completeness. It should be noted furthermore that the list does not include substantial replacements and additions to the truck fleets of the many contract carriers which perform collection and delivery and local freight services for the railroads.

Orders for Highway Vehicles

Purchaser	No.	Type of Vehicle	Seating capacity or truck capacity in tons	Where to be used	Manufacturer
Alton & Southern	1	Automobile	.....	Co. Business	Chevrolet
Atchison, Topeka & Santa Fe	1	Automobile	.....	Co. Business	Packard
Santa Fe Transportation Co. (California)	15	Bus	33	Rev.	a.c.f Motors
	15	Bus	55	Rev.	a.c.f Motors
Santa Fe Transportation Co. (Delaware)	1	Truck	1½ ton	Rev.	Ford
Santa Fe Trails of Illinois, Inc.	1	Automobile	.....	Co. Business	Chevrolet
	1	Automobile	.....	Co. Business	Chrysler
Santa Fe Trail Transportation Co.	8	Bus	25	Rev.	Flxible
	2	Automobile	.....	Co. Business	Chrysler

Continued on next left-hand page


TWELVE new 2-8-8-4 high-speed Mallets have recently been delivered by Lima to the Southern Pacific. These locomotives are outstanding examples of the type that is being ordered by the progressive railroads to meet the present-day demands of heavier loads moved at higher speeds.
SOUTHERN PACIFIC LINES
3800
LIMA LOCOMOTIVE WORKS
INCORPORATED, LIMA, OHIO

Purchaser	No.	Type of Vehicle	Seating capacity or truck capacity in tons	Where to be used	Manufacturer
Southern Kansas Greyhound Lines, Inc.	2	Bus	37	Rev.	a.c.f Motors
Atlanta & West Point and Western Ry. of Alabama	1	Truck	.....	Co. Business	Dodge
	1	Truck	1½ ton	Co. Business	Chevrolet
Atlantic Coast Line	1	Truck	1½ ton	Rev.	Chevrolet
Baltimore & Ohio	6	Automobile	.....	Co. Business	Chevrolet
	5	Automobile	.....	Co. Business	Ford
	1	Automobile	.....	Co. Business	Buick
	1	Automobile	.....	Co. Business	Plymouth
	1	Automobile	.....	Co. Business	Nash-Kelvinator
West Virginia Transportation Co.	4	Bus	29	Rev.	White
Camden Warehouse, Inc.	1	Truck	1½ ton	Rev.	Ford
B. R. & P. Warehouse, Inc.	1	Truck	1½ ton	Rev.	Ford
Bangor & Aroostook	1	Bus	31	Rev.	General Motors
	1	Truck	4 ton	Rev.	General Motors
Belt Railway of Chicago	1	Truck	2 ton	Co. Business	Int. Harvester
Bessemer & Lake Erie	1	Automobile	5	Co. Business	Plymouth
Boston & Maine	2	Bus	.....	Co. Business	.....
	2	Truck	½ ton	Co. Business	.....
	2	Truck	1½ ton	Co. Business	.....
	1	Truck	2 ton	Co. Business	.....
	4	Automobile	2	Co. Business	.....
	2	Automobile	5	Co. Business	.....
Boston & Maine Transportation Co.	5	Bus	37	Rev.	a.c.f. Motors
	2	Bus	21	Rev.	General Motors
	1	Bus	32	Rev.	General Motors
	1	Bus	25	Rev.	Flxible
	4	Tractor	.....	Rev.	.....
	3	Trailer	10 ton	Rev.	.....
Central of New Jersey	1	Automobile	.....	Co. Business	Chevrolet
	1	Automobile	.....	Co. Business	Plymouth
Chesapeake & Ohio	2	Bus	.....	Co. Business	Ford
	1	Truck	1 ton	Co. Business	Ford
	3	Automobile	5	Co. Business	Chrysler
	1	Automobile	5	Co. Business	Chevrolet
Chicago, Burlington & Quincy	1	Truck	.....	Co. Business	Int. Harvester
	5	Automobile	5	Co. Business	Ford
	1	Automobile	5	Co. Business	Plymouth
Burlington Transportation Co.	21	Bus	28	Rev.	General Motors
	7	Bus	25	Rev.	General Motors
	3	Bus	29	Rev.	Flxible
	2	Bus	37	Rev.	General Motors
	2	Truck	1½ ton	Rev.	Ford
	2	Truck	1½ ton	Rev.	Chevrolet
	1	Truck	½ ton	Rev.	Chevrolet
	6	Tractor	3 ton	Rev.	General Motors
	6	Tractor	2 ton	Rev.	Int. Harvester
	3	Tractor	3 ton	Rev.	White
	2	Tractor	3 ton	Rev.	Int. Harvester
	1	Automobile	5	Co. Business	Ford
Chicago, Milwaukee, St. Paul & Pacific	5	Truck	1½ ton	.....	.....
	3	Truck	.....	.....	.....
	1	Tractor	1½ ton	.....	.....
	7	Trailer	.....	.....	.....
	15	Automobile	5	.....	.....
Chicago, St. Paul, Minneapolis, & Omaha	1	Truck	1½ ton	Co. Business	General Motors
Chicago, South Shore & South Bend	1	Truck	3 ton	Co. Business	Int. Harvester
	2	Automobile	2	Co. Business	Ford
	2	Automobile	2	Co. Business	Studebaker
Columbus & Greenville	2	Tractor	7 ton	Rev.	Int. Harvester
	2	Trailer	7 ton	Rev.	Carter Mfg. Co.
Copper Range	1	Bus	22	Rev.	Studebaker
Detroit, Toledo & Ironton	11	Automobile	5	Co. Business	Ford
Erie	3	Truck	1½ ton	Co. Business	Chevrolet
	1	Truck	½ ton	Co. Business	Ford
	1	Truck	1½ ton	Co. Business	Ford
	1	Truck	½ ton	Co. Business	Dodge
	11	Automobile	5	Co. Business	Plymouth
	10	Automobile	5	Co. Business	Chevrolet
	3	Automobile	5	Co. Business	Ford
	2	Automobile	5	Co. Business	Dodge
	1	Automobile	5	Co. Business	Nash
Georgia Railroad	1	Truck	½ ton	Co. Business	Ford
Gulf Coast Lines	1	Truck	2 ton	Co. Business	Ford
	2	Automobile	.....	Co. Business	General Motors
	2	Automobile	.....	Co. Business	Ford
Gulf, Mobile & Northern Gulf Transport Co.	3	Bus	25-29	Rev.	Flxible
	1	Bus	24-29	Rev.	Fitzjohn Body Co.
	8	Tractor	2-3 ton	Rev.	Int. Harvester
	10	Trailer	7 ton	Rev.	Carter Mfg. Co.
	2	Trailer	5 ton	Rev.	Carter Mfg. Co.
	1	Trailer	5 ton	Rev.	Fruehauf
	1	Trailer (Tank)	.....	Rev.	Carter Mfg. Co.
Illinois Terminal Railroad	1	Bus	24	Rev.	General Motors
International-Great Northern	1	Truck	2 ton	Co. Business	Ford
	3	Automobile	.....	Co. Business	General Motors
	1	Automobile	.....	Co. Business	Ford
Kansas City Southern Kansas City Southern Transport Co., Inc.	1	Bus	25	Rev.	Flxible
	1	Truck	1½ ton	Rev.	Dodge
	3	Tractor	1½ ton	Rev.	Int. Harvester
	3	Tractor	1½ ton	Rev.	Ford
	1	Tractor	1½ ton	Rev.	Chevrolet
	5	Trailer	.....	Rev.	Nabors
	1	Trailer	.....	Rev.	Fruehauf
Lehigh Valley	2	Truck	½ ton	Co. Business	Chrysler
	1	Truck	1½ ton	Co. Business	Chrysler
	1	Truck	¾ ton	Co. Business	General Motors
	1	Truck	1 ton	Co. Business	Chrysler
	12	Automobile	5	Co. Business	Chrysler
	2	Automobile	5	Co. Business	General Motors
	2	Automobile	2	Co. Business	Ford
	1	Automobile	5	Co. Business	Nash

Purchaser	No.	Type of Vehicle	Seating capacity or truck capacity in tons	Where to be used	Manufacturer
Louisiana & Arkansas					
Louisiana, Arkansas & Texas Transportation Co.	1	Truck	1½ ton	Rev.	Chevrolet
	1	Truck	1½ ton	Rev.	Ford
	1	Truck	1½ ton	Rev.	Int. Harvester
	1	Truck	1½ ton	Rev.	Ford
	1	Truck	¾ ton	Rev.	Int. Harvester
	2	Tractor	2 ton	Rev.	Int. Harvester
	1	Tractor	1½ ton	Rev.	Chevrolet
	1	Trailer	7 ton	Rev.	Fruehauf
	1	Trailer	7 ton	Rev.	Nabors
	1	Trailer	5 ton	Rev.	Nabors
Maine Central					
Maine Central Transportation Co.	2	Bus	37	Rev.	a.c.f. Motors
	2	Bus	25	Rev.	Flxible
Minneapolis & St. Louis	1	Automobile	5	Co. Business	Ford
Minneapolis, St. Paul & Sault Ste. Marie	2	Truck	¾ ton	Co. Business	Ford
	1	Truck	½ ton	Co. Business	Ford
	2	Automobile	5	Co. Business	General Motors
Missouri & Arkansas	1	Automobile	.....	Co. Business	Chevrolet
Missouri-Kansas-Texas	1	Bus	22	Co. Business	Chevrolet
	1	Automobile	5	Co. Business	Chevrolet
Missouri Pacific	1	Truck	3 ton	Co. Business	General Motors
	1	Tractor	1½ ton	Co. Business	General Motors
	1	Trailer (Tank)	10 ton	Co. Business	General Motors
	24	Automobile	5	Co. Business	Chevrolet
	6	Automobile	5	Co. Business	Ford
	2	Automobile	5	Co. Business	Plymouth
	1	Automobile	5	Co. Business	De Soto
Monongahela	1	Truck	1½-2 ton	Rev.	Ford
Montour	1	Truck	½ ton	Co. Business	Chevrolet
New York Central	3	Truck	1½ ton	Co. Business	.....
	1	Truck	¾ ton	Co. Business	.....
	1	Truck	2 ton	Co. Business	.....
	1	Truck	1 ton	Co. Business	.....
	1	Truck	1½-2 ton	Co. Business	.....
	1	Truck	2-3 ton	Co. Business	.....
	1	Truck	4 ton	Co. Business	.....
	1	Truck	5 ton	Co. Business	.....
New York, Chicago & St. Louis	1	Truck	2-2½ ton	Co. Business	Ford
	1	Truck	1½ ton	Co. Business	Ford
	1	Truck	1½ ton	Co. Business	Chevrolet
	1	Truck	1½ ton	Co. Business	Int. Harvester
	1	Automobile	5	Co. Business	Chevrolet
	1	Automobile	5	Co. Business	Ford
New York, New Haven & Hartford	5	Bus	40	Co. Business	Ford
	2	Bus	.....	Co. Business	Ford
	18	Truck	3 ton	Co. Business	Fargo
	5	Truck	½ ton	Co. Business	Fargo
	5	Truck	¾ ton	Co. Business	Int. Harvester
	2	Truck	3 ton	Co. Business	Ford
	1	Truck	5 ton	Co. Business	Brockway
	1	Truck	3-4 ton	Co. Business	Int. Harvester
	1	Truck	1 ton	Co. Business	Fargo
	1	Truck	5 ton	Co. Business	Int. Harvester
	1	Automobile	2	Co. Business	Ford
	1	Automobile	5	Co. Business	Ford
New England Transportation Co.	13	Bus	27	Rev.	General Motors
	7	Bus	24	Rev.	General Motors
	6	Truck	7½ ton	Rev.	General Motors
	26	Tractor	10 ton	Rev.	General Motors
	2	Tractor (Diesel)	8 ton	Rev.	General Motors
	2	Tractor (Diesel)	10 ton	Rev.	General Motors
	10	Trailer	10 ton	Rev.	Fruehauf
County Transportation Co.	2	Bus	38	Rev.	General Motors
Connecticut Company	45	Bus	38	Rev.	General Motors
	2	Bus (Diesel)	40	Rev.	General Motors
	3	Bus	25	Rev.	General Motors
	4	Bus	27	Rev.	White
	1	Bus	33	Rev.	General Motors
	1	Bus	21	Rev.	General Motors
	1	Bus	31	Rev.	Reo
	1	Truck	5 ton	Co. Business	Ford
Berkshire Street Railway	5	Bus	19	Rev.	General Motors
	3	Bus	21	Rev.	General Motors
	2	Bus	25	Rev.	General Motors
	1	Truck	½ ton	Rev.	General Motors
New York, Ontario & Western	1	Truck	.....	Co. Business	Chrysler
Norfolk & Western	2	Bus	.....	Co. Business	Ford
	2	Automobile	5	Co. Business	Ford
	2	Automobile	5	Co. Business	Chevrolet
	1	Automobile	5	Co. Business	Dodge
	4	Truck	¾ ton	Co. Business	Chevrolet
	2	Truck	1 ton	Co. Business	Ford
	2	Truck	¾ ton	Co. Business	Int. Harvester
	1	Truck	½ ton	Co. Business	Ford
	1	Truck	¾ ton	Co. Business	Dodge
Norfolk Southern					
Norfolk Southern Bus Corp.	3	Bus	25	Rev.	Flxible
Northern Pacific					
Northern Pacific Transport Co.	1	Bus	28	Rev.	Kenworth
	1	Bus	18	Rev.	White
	1	Trailer	3½ ton	Rev.	Brown
	1	Automobile	5	Co. Business	Chevrolet
Northwestern Improvement Co.	1	Truck	1½ ton	Co. Business	Ford
Yellowstone Park Co.	10	Bus	14	Rev.	White
	1	Truck	¼ ton	Co. Business	Ford
	2	Truck	1½ ton	Co. Business	Ford
Pennsylvania	25	Truck	Less than 3 ton	Co. Business	.....
	6	Truck	3-5 ton	Co. Business	.....
Pennsylvania highway subsidiaries	31	Bus	37	Rev.	.....
	21	Bus	25	Rev.	.....
	130	Truck	Less than 3 ton	Rev.	.....
	23	Truck	3-5 ton	Rev.	.....
	5	Truck	Over 10 ton	Rev.	.....
	47	Tractor	Less than 3 ton	Rev.	.....
	20	Tractor	3-5 ton	Rev.	.....
	7	Tractor	5-10 ton	Rev.	.....
	48	Trailer	3-5 ton	Rev.	.....
	5	Trailer	Over 10 ton	Rev.	.....
	16	Automobile	.....	Co. Business	.....

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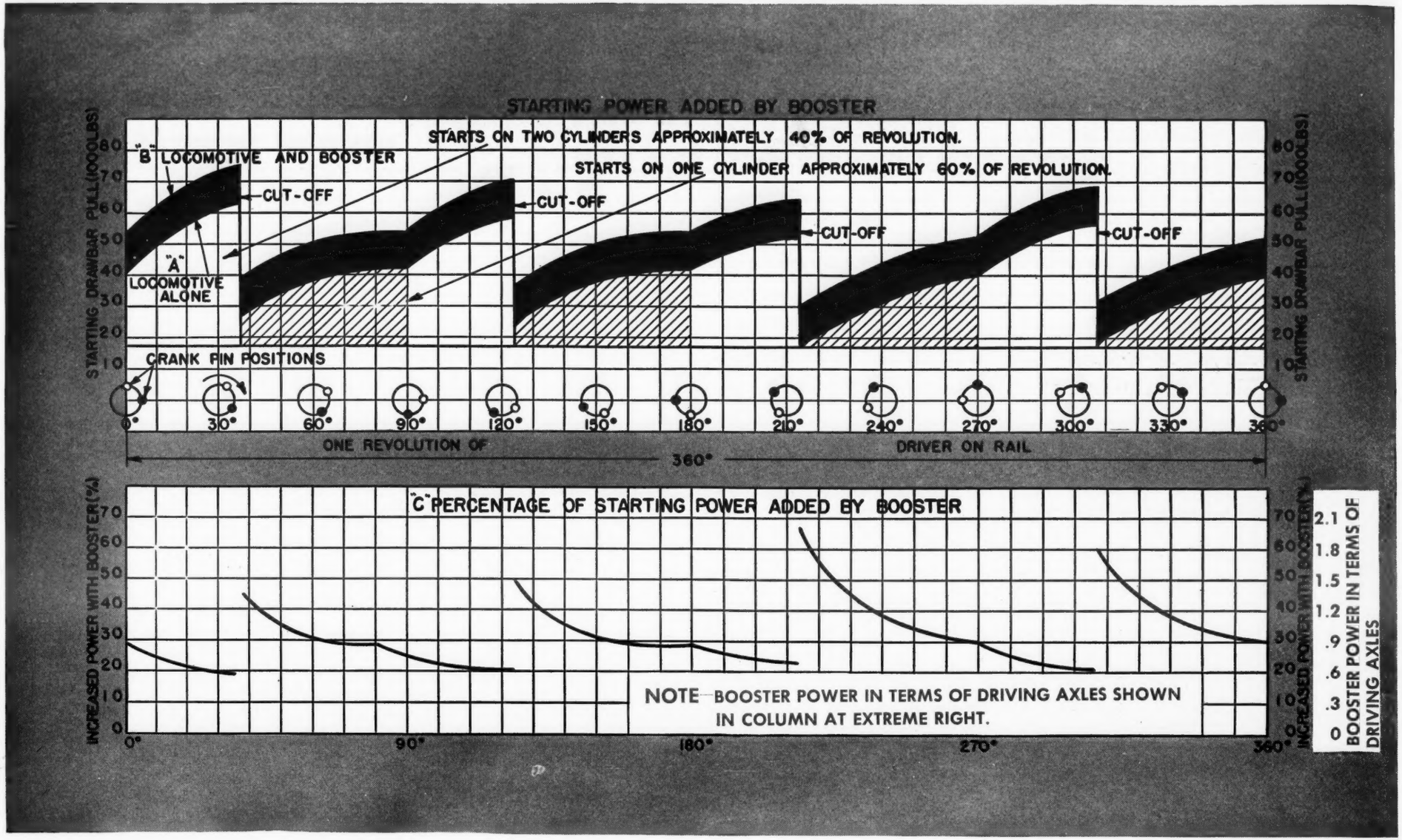


STARTING POWER ADDED BY BOOSTER*

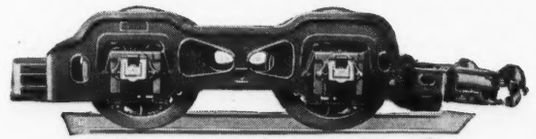
THE rated draw bar pull of a locomotive is the average of the constantly varying effort exerted throughout one revolution of the driving wheels. Such a rating considers that the locomotive is moving and is by no means a correct indication of the power exerted in starting from a state of rest.

Starting power depends entirely upon the exact position of the cranks at the instant of starting. Crank position not only controls the leverage between piston and driving wheel but also determines whether or not both valves are open for admission of steam to the cylinders.

The above chart illustrates a typical starting draw bar pull curve for a modern two-cylinder locomotive with Booster. Curve "A" shows the starting draw bar pull of the main locomotive for all crank positions. Curve "B" represents the combined starting draw bar pull of the locomotive and Booster, the shaded area between curves "A" and "B" being the starting draw bar pull added by the Booster. Curve "C" in the lower portion of the chart shows in percent the increased power with the Booster for all crank positions.

The chart also clearly shows that for about 216° or 60.4% of the crank circle the power of only one cylinder is available for starting. This means that most starts would be made with one cylinder, or slack would have to be taken to place the cranks in a more favorable position, if Booster power is not used.

It will also be observed that at four points on the crank circle the starting effort of the locomotive reaches a minimum at which approximately one-third of the rated draw bar pull is exerted. It is at these low points that Booster power is most effective, in some cases adding as much as 67% to the starting draw bar pull of the locomotive, or the equivalent of 2 additional driving axles.



*Trademark Registered United States Patent Office

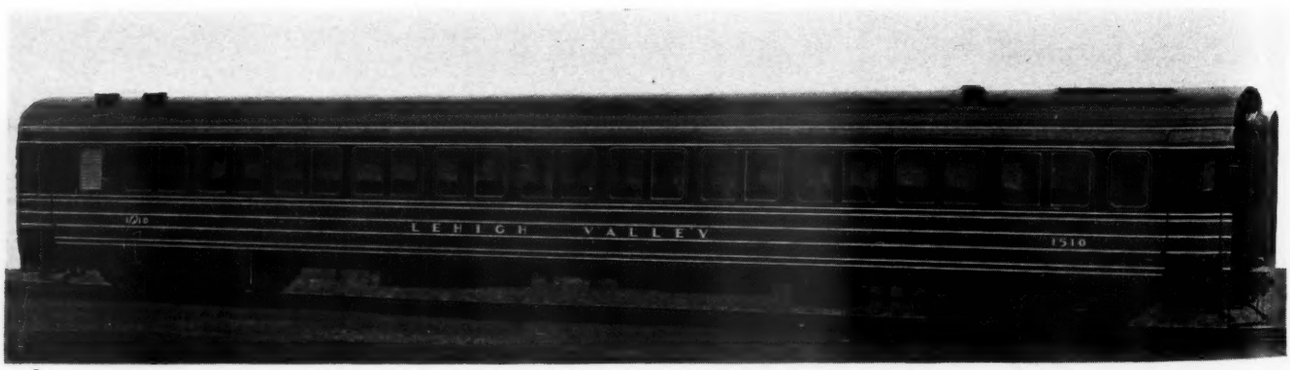
Purchaser	No.	Type of Vehicle	Seating capacity or truck capacity in tons	Where to be used	Manufacturer
Pennsylvania-Reading Seashore Lines	3	Truck	1½ ton	Co. Business	Ford
	3	Truck	1½ ton	Co. Business	Int. Harvester
	1	Truck	¾ ton	Co. Business	Ford
Peoria & Pekin Union	1	Truck	2 ton	Co. Business	Int. Harvester
Pere Marquette	1	Automobile	2	Co. Business	Chevrolet
Railway Express Agency	885	Truck	.....	.....	.....
	45	Tractor	.....	.....	.....
	72	Trailer	.....	.....	.....
	32	Automobile	.....	.....	.....
Reading					
Reading Transportation Company	20	Bus	29	.....	.....
St. Louis-San Francisco					
Frisco Transportation Co.	1	Trailer	9 ton	Rev.	John C. Dix & Son
	1	Trailer	9 ton	Rev.	Springfield Wagon & Trailer
St. Louis Southwestern					
Southwestern Transportation Co.	2	Truck	1½ ton	Rev.	Chevrolet
	6	Tractor	2 ton	Rev.	Int. Harvester
	13	Trailer	5 ton	Rev.	Fruehauf
	2	Automobile	5	Co. Business	Ford
	2	Automobile	5	Co. Business	Dodge
	1	Automobile	5	Co. Business	Plymouth
Southwestern Greyhound Lines, Inc.	20	Bus	37	Rev.	General Motors
Southern Pacific	1	Truck	.....	Co. Business	.....
	2	Truck	1½ ton	Co. Business	.....
	1	Trailer	.....	Co. Business	.....
	4	Automobile	5	Co. Business	.....
Pacific Motor Trucking Co.	5	Truck	1½ ton	Rev.	.....
	2	Truck	2 ton	Rev.	.....
	1	Truck (Diesel)	3½ ton	Rev.	.....
	4	Trailer	.....	Rev.	.....
Pacific Greyhound Lines	27	Bus	37	Rev.	General Motors
	24	Bus	42	Rev.	General Motors
	12	Bus	25	Rev.	General Motors
	1	Truck	1½ ton	Co. Business	Chevrolet
	6	Automobile	5 ton	Co. Business	Chevrolet
Texas & New Orleans Railroad	2	Truck	2 ton	Co. Business	Chevrolet
	4	Automobile	5	Co. Business	Chevrolet
Southern Pacific Transport Co.	2	Truck	1½ ton	Rev.	Chevrolet
	1	Truck	1½ ton	Rev.	Dodge
	1	Tractor	1½ ton	Rev.	Chevrolet
	1	Trailer	1½ ton	Rev.	Nabors
	1	Automobile	3	Co. Business	Chevrolet
Texas & Pacific	1	Truck	1½ ton	Co. Business	Ford
	5	Automobile	.....	Co. Business	Ford
	1	Automobile	.....	Co. Business	Lincoln
	1	Automobile	.....	Co. Business	Mercury
	1	Automobile	.....	Co. Business	Plymouth
	1	Automobile	.....	Co. Business	Oldsmobile
T. & P. Motor Transport Co.	5	Truck	1½ ton	Co. Business	Ford
	2	Truck	1½ ton	Co. Business	Chevrolet
	4	Tractor	2½ ton	Co. Business	Ford
	1	Automobile	.....	Co. Business	Ford
	1	Automobile	.....	Co. Business	Chevrolet
Toledo Terminal Railroad	1	Automobile	5	Co. Business	Ford
	1	Automobile	5	Co. Business	General Motors
Union Pacific					
Utah Parks Co.	8	Bus	18	Rev.	White
	2	Truck	1½ ton	Co. Business	General Motors
	1	Truck	¾ ton	Co. Business	General Motors
	1	Truck	3½ ton	Co. Business	White
	2	Automobile	5	Co. Business	General Motors
	1	Automobile	7	Rev.	General Motors
	1	Automobile	5	Rev.	General Motors
Interstate Transit Lines	14*	Bus	36	Rev.	General Motors
	3	Automobile	5	Co. Business	Chevrolet
Union Railroad	1	Truck	½ ton	Co. Business	Int. Harvester
Virginian	1	Automobile	5	Co. Business	Chrysler
Visalia Electric	1	Automobile	5	Co. Business	.....
Wisconsin Central	1	Automobile	5	Co. Business	General Motors
	1	Automobile	5	Co. Business	Nash

* Ordered in 1938; delivered in 1939.

Canada

British Columbia Electric Railway	8	Bus	31	Rev.	Twin Coach
National Harbours Board	1	Automobile	5	Co. Business	Ford
Toronto, Hamilton & Buffalo	1	Truck	1½ ton	Co. Business	Int. Harvester

* * *



Lightweight Coach Built for the Lehigh Valley by Pullman-Standard Car Mfg. Co.

NEWS

City of San Francisco Wrecked by Sabotage

Evidence before the Bureau of Safety is conclusive that rail had been misalined before the accident occurred

The disastrous wreck of the streamliner "City of San Francisco" on the evening of August 12, 1939, while traveling westward in Northern Nevada, was caused by "malicious tampering with the track", according to the report of the Bureau of Safety of the Interstate Commerce Commission, released late last week following a thorough investigation on its part, this verdict substantiating the findings of the railway's Board of Inquiry shortly after the accident, which were reported in the *Railway Age* of September 23. According to all testimony taken at the Bureau's inquiry, including that of its own inspectors, indications are that a joint on the high rail of the curve involved had been disconnected, the angle bars removed, and the east end of the receiving rail moved inward about 4⅝ in. on the tie, setting up an ideal derailing condition.

Stout, Well-Maintained Track

The accident to the streamliner City of San Francisco, which resulted in the death of 9 passengers and 15 dining-car employees, and the injury of 99 passengers, 1 train-service employee, one stewardess, 11 dining-car employees, and 3 train porters, occurred on the line of the Southern Pacific at a point approximately 1.55 miles east of the station at Harney, Nev., and 169.5 ft. east of bridge No. 518.54. Approaching from the east, there is a tangent 437 ft. in length, followed by a 3-deg. curve to the right, extending 875 ft. to the point of derailment and 1,215 ft. beyond.

The track structure consists of 130-lb. P. S. section rail, in 39-ft. lengths, laid new in 1931 and 24 treated fir ties to the rail length. It is fully tie-plated with Lundie canted tie plates, which are corrugated on the bottom surface for secure grip on the ties. The intermediate plates are 8¾ in. by 10½ in. and have spike holes spaced 3½ in. between centers. The joint plates are 8¾ in. by 11 in. and have offset spike holes spaced 3½ in. between centers.

On the curve involved, there are four spikes per tie plate, two being inside of the rail and two outside of the rail. The angle bars are 24 in. in length and have four holes each, the bolts used being secured by nuts and lock washers. The rail joints are bonded for signal circuits with two No. H galvanized wires, 52 in. in length, looped at each end, housed behind the angle bars, and secured to each rail by channel pins which are spaced 28 in. apart. The track is laid on 12 in. of crushed rock ballast, is well maintained, and has superelevation at the point of accident of 4⅛ in.

Bridge No. 518.54 was a through riveted Warren truss span, 120 ft. long, which had recently been strengthened and was capable of carrying Cooper's E-50 loading. The bridge, which was equipped with 90-lb., second-hand guard rails, had a rail height of 33 ft. above the Humboldt river.

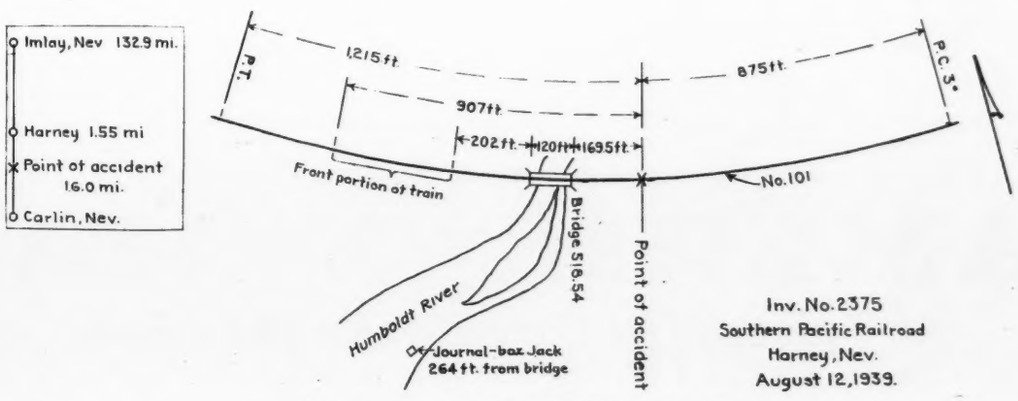
Signals Nos. 5213 and 5195, governing westward movements, are located 14,069 and 4,963 ft., respectively, east of the point of accident, and the maximum authorized speed for streamlined trains around the curve involved is 60 m. p. h.

At the time of the accident, which occurred at 9:33 p. m., the weather was clear and it was dark.

Consist of the Train

The "City of San Francisco" at the time of the accident consisted of 3 power units, an auxiliary power and dormitory unit, 2 chair units, 2 kitchen-diner units, 1 dormitory-club unit, 7 Pullman sleeping units and 1 lounge unit, in the order named. The three power units were of steel-frame construction, the bodies being of ⅜-in. plywood covered with 27-gage galvanized iron. The remainder of the units were of aluminum alloy with steel end-sills, body bolsters and cross bearers.

This train departed from Carlin, Nev., 16 miles east of the point of accident, at 9:15 p. m., according to the train sheet, 29 min. late, and 18 min. later became derailed 169.5 ft. east of Bridge 518.54, while moving at a speed of 60 m. p. h. The three power units and the following two units, remaining coupled, became derailed, passed over the bridge on the ties, and stopped with the front end about 907 ft. west of the point of derailment. Power unit No. 1, slightly damaged, stopped upright on the ties at approximately 11 in. to the left of the line of track. Power unit No. 2, also slightly damaged, and inclined at an angle of 15 deg. to the left, stopped with its front truck on the ties, about 12 in. to the left of the line of track, and with its rear truck on the ballast.



Track Layout in Vicinity of Point of Accident

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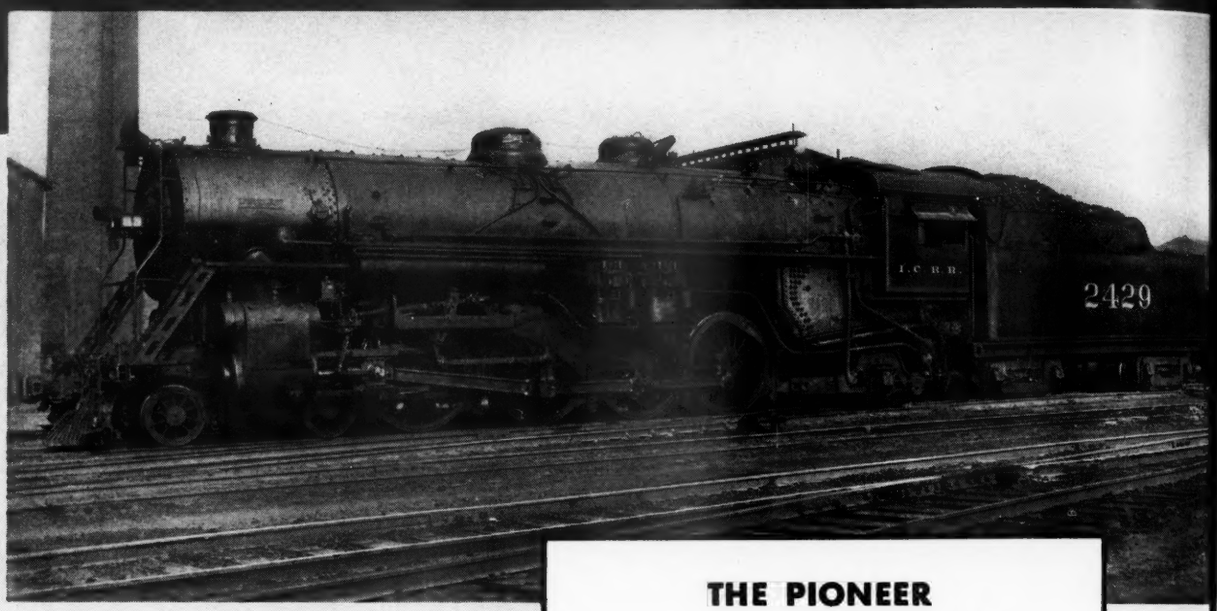
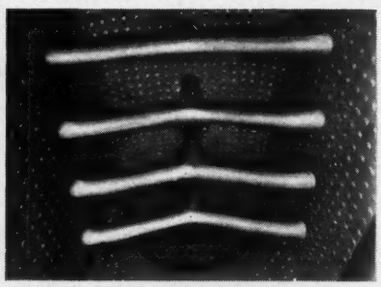
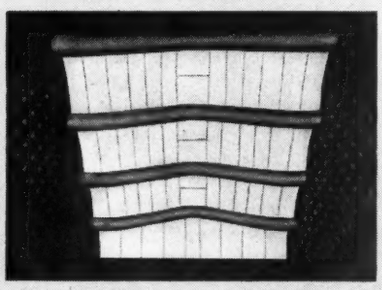
SECURITY CIRCULATORS





View illustrating the positioning of Security Circulators in an average size of locomotive firebox prior to installing the brick arch.



Typical Security Circulator and brick Arch Installation in a locomotive firebox. The small sectional brick are as readily applied as in an ordinary arch tube firebox.

THE PIONEER IN DEVELOPMENT OF SECURITY CIRCULATORS

5½ years' service original application without expense for repairs to Circulator Units.

RISER ARM of Circulator compensates for crown bolts displaced.

CROWN SHEET strengthened by strut effect of Circulators.

AMERICAN ARCH

Security Circulator Division

MAKING RECORDS for low maintenance

427 SECURITY CIRCULATORS

17 RAILROADS

82 LOCOMOTIVES

3 MILLION MILES OF SERVICE

Security Circulator means what the name implies

★

30 years' combustion engineering experience behind our recommendation.

Improved Arch Support for the largest fireboxes

★

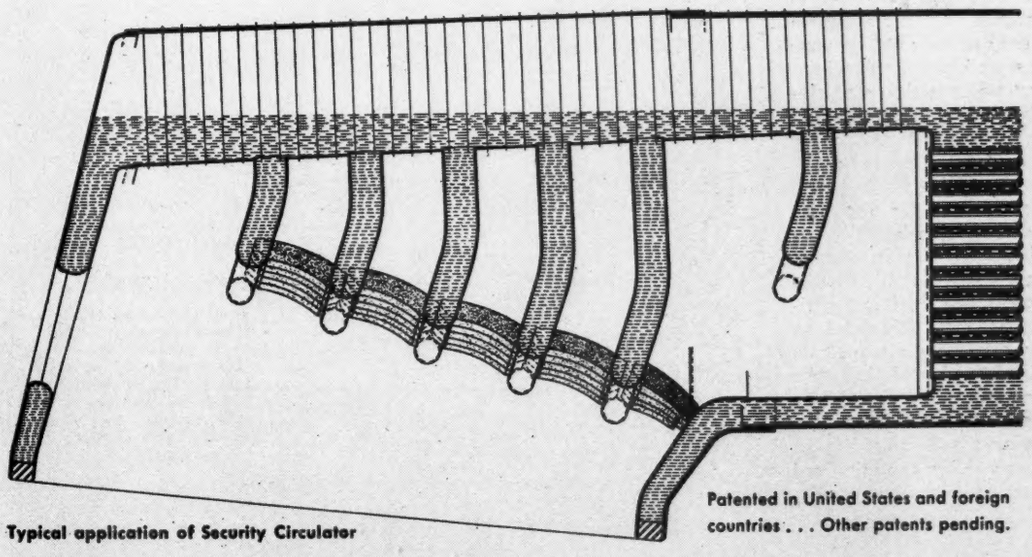
Adapted to any type of locomotive

★

Reduced honeycombing, flue plugging and cinder cutting

★

Improved circulation in side water legs



Typical application of Security Circulator

Patented in United States and foreign countries . . . Other patents pending.

COMPANY, INC.

NEW YORK CHICAGO

Power unit No. 3, inclined to the left at an angle of 45 deg., stopped with its front end on the fill and its rear end down the embankment, the left eave of this unit bearing indications of having struck the bridge truss.* According to a statement formulated by the railroads and the Pullman Company, the extent of the damage sustained by the equipment in the accident amounted to $670,315.20.

Discussion of Evidence

Summarizing the testimony presented at its inquiry, which showed unusual agreement in the observations of employees on the wrecked streamliner, engineering and operating officers of the road, local citizens and the inspectors of the Bureau itself, the Bureau's report said as follows:

According to the evidence, train No. 101 (the "City of San Francisco") was not moving in excess of the maximum allowed speed of 60 m. p. h. when it became derailed. The train was riding smoothly and there was no indication of defective equipment.

Prior to the arrival of the train at the point of derailment, the track was structurally sound, was maintained in excellent condition, and the automatic block signals were displaying proceed indications. Upon entering the curve upon which the accident occurred, the engineman saw an object about 300 ft. distant, which later was found to be a tumbleweed lying on the south or high rail of the curve. When the train reached that point, the front truck became derailed and the engineman thought that a rock had been struck. Subsequent examination of the track disclosed that on the south rail the angle bars had been removed from a joint located 169.5 ft. east of bridge 518.54, and the angle bars, bolts, nuts and tight-lock washers were lying adjacent to the disconnected rail. Apparently a wrench had been used to remove the nuts, as none of the bolts was cut or broken. The joint tie plate on the first tie beneath the receiving end of the disconnected rail had been removed and an intermediate tie plate had been placed 4⅝ in. inward from the alinement of the south rail and fully spiked with four spikes. The position of this plate was not a result of the tie moving laterally under impact resulting from the derailment, as there was no indication in the ballast of any tie being moved from its original position. The tie plate had been misplaced, as the outline of the original plate seat on the tie was clearly defined, and the spike holes indicated fresh and recent disturbance of the wood fibre, such as would follow the action of withdrawing a spike.

Of the four spikes holding the misalined tie plate, the two outside spikes were fully driven while the two inside spikes were found withdrawn a distance of 2.88 and 3.1 in., respectively, above the plate; this indicated a revolving lateral motion of the receiving rail which caused the inside spikes to be drawn sufficiently to permit the rail to roll free. The rail at the same time was being pushed westward because of the friction imparted to it by the pilot casting, a longitudinal movement of 10½ in. being sufficient to clear the spikes in order that the rail could be pushed laterally toward the north rail.

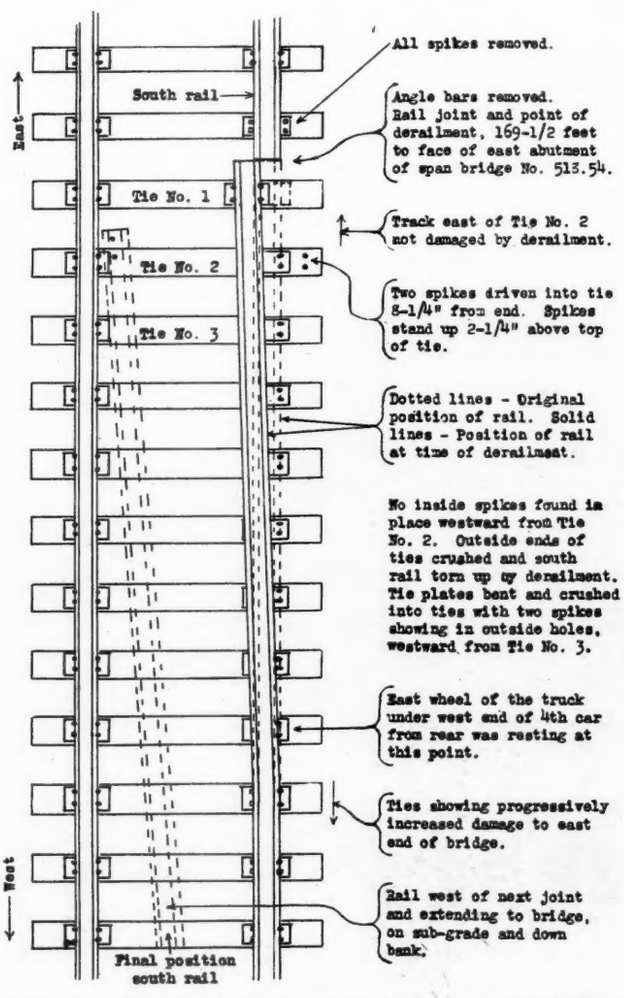
Evidence of Misalined Rail Conclusive

The receiving rail having been moved inward 4⅝ in. provided a gap of approximately 1⅝ in., as the ball of the rail was 3 in. in width. The front wheel flanges being 1-$^{5}/_{32}$ in. in thickness, could readily fit into the gap. As the misalined rail was on the high side of a 3-deg. curve, centrifugal force at 60 m.p.h. would throw the wheel flange tightly against the ball of the leaving rail and prevent the flange from riding over the ball of the receiving rail. Further observation disclosed that all four spikes in the plate at the end of the leaving rail had been drawn without disturbing the position of the rail or tie plate. All inside spikes on the south ends of at least nine ties following the point of derailment had been drawn. A dent on the end of the receiving rail at the top and on the south side of the ball indicated that the flange of a wheel had struck the end of this rail. There was a corresponding mark on the back of the flange of the left front wheel of power Unit No. 1. There were no damaged angle bars or bolts, which would have been the case if the rail had been in proper alinement when the train approached. The evidence is conclusive that this rail had been misalined before the accident occurred.

The investigation developed that the receiving rail, after being freed by the removal of the angle bars and spikes, was pushed over by means of either a journal jack or track bar. It is probable that the former was used, as a jack was recovered from the river bed near the scene of the accident. After the accident, an unusual spike arrangement was found on tie No. 2, which would permit a journal jack to be placed between the spikes, driven 8¾-in. from the end of the tie, and the web of a rail in normal position. With the angle bars removed there would be sufficient slack in the signal bond wires at the rail joint to permit a rail to be moved inward about 16 in. before the bond wires would be broken; and a movement of only 4⅝ in. would be insufficient to disturb the circuit in such manner as to cause the block signals immediately east of the point of accident to display restrictive indications.

The ball of the misalined rail had been painted and a tumbleweed placed over the disconnected joint. As any irregularities of track alinement are clearly defined by the reflection of a headlight on the shining surface of the rails, it is reasonable to assume that these measures were taken so that the engineman of an approaching train

(*Continued on page 112*)



Sketch Showing Normal, Misalined and Final Positions of Rail Involved

Continued on next left-hand page

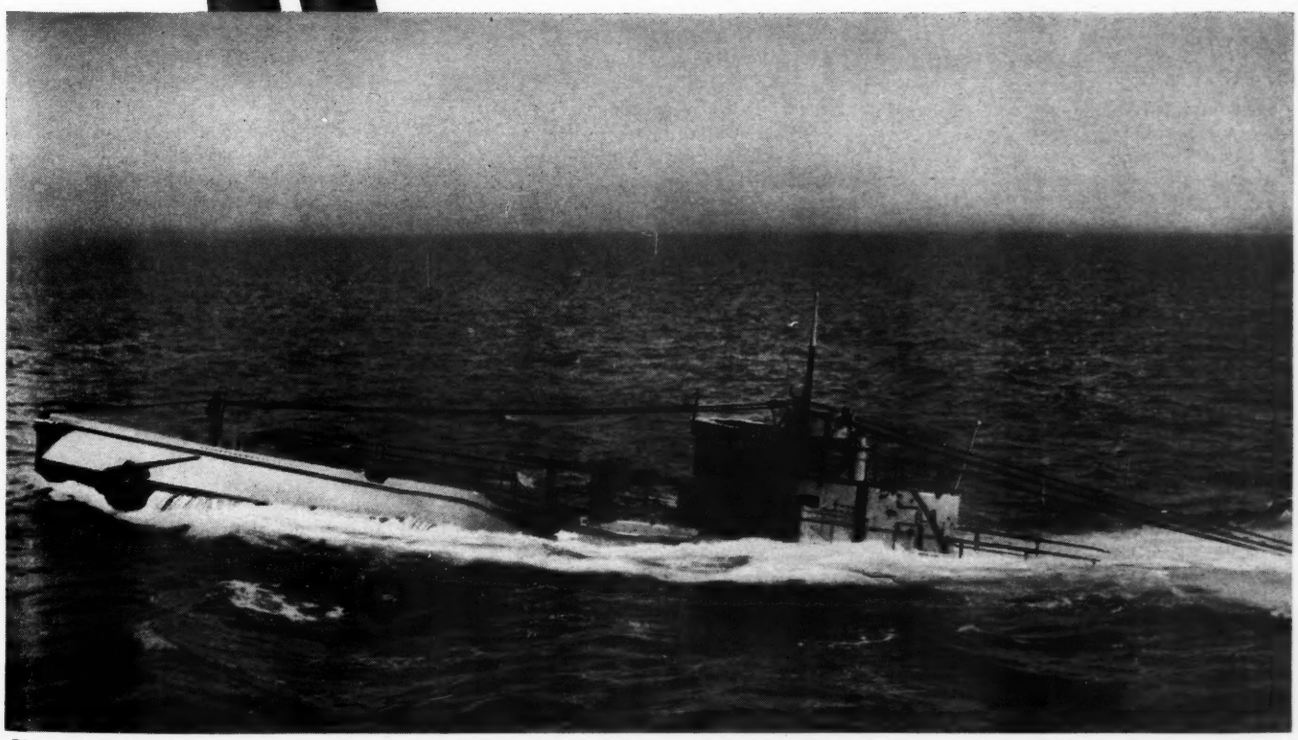
* Details relative to the extent of the damage sustained by the other units of equipment in the train were given in articles appearing in the *Railway Age* of August 19, page 289, and September 2, page 350.

The *Invisible* Part Is Important

The interior of superheater units—the invisible part—is especially important as it conveys the flow of steam to the cylinders at speeds as high as 200 m.p.h.

When superheater units have served a useful life, have them remanufactured by the Elesco remanufacturing service. It is the only method whereby the smooth interiors and exteriors can be maintained. They are renewed by the exclusive Elesco machine-die-forging process without creating joint ridges.

Standardize on this dependable service—it is low in ultimate cost.



Photo—R. I. Nesmith

ELESCO

A-1378

THE SUPERHEATER COMPANY

Representative of AMERICAN THROTTLE COMPANY, INC.

60 East 42nd Street, NEW YORK 122 S. Michigan Ave., CHICAGO

Canada: THE SUPERHEATER COMPANY, LTD., MONTREAL

Superheaters « Exhaust Steam Injectors « Feedwater Heaters « American Throttles « Pyrometers « Steam Dryers

11 Months N. O. I. Was $526,963,291

2.18 per cent return compares with 1.34 per cent in same period of 1938

Class I railroads of the United States in the first 11 months of 1939, had a net railway operating income of **$526,963,291** which was at the annual rate of return of 2.18 per cent, according to the Bureau of Railway Economics of the Association of American Railroads and made public today. In the first 11 months of 1938 their net railway operating income was $323,731,784 or 1.34 per cent, and in the first eleven months of 1930, it was $820,214,052 or 3.38 per cent. The November, 1939, net was of $70,345,795 or 3.29 per cent, compared with $49,692,171 or 2.32 per cent in November, 1938, and $61,175,416 or 2.88 per cent in November, 1930.

CLASS I RAILROADS—UNITED STATES

	1939	1938	1930
Month of November			
Total operating revenues	$368,026,739	$319,629,292	$394,261,533
Total operating expenses	256,170,175	231,203,840	295,812,115
Taxes	30,567,747	27,745,881	25,418,475
Net railway operating income	70,345,795	49,692,171	61,175,416
Operating ratio—per cent	69.61	72.33	75.03
Rate of return on property investment—per cent	3.29	2.32	2.88
Eleven Months Ended November 30			
Total operating revenues	$3,649,823,994	$3,246,548,535	$4,906,580,018
Total operating expenses	2,669,203,048	2,488,875,026	3,636,468,116
Taxes	332,335,470	314,084,140	328,645,340
Net railway operating income	526,963,291	323,731,784	820,214,052
Operating ratio—per cent	73.13	76.66	74.11
Rate of return on property investment—per cent	2.18	1.34	3.38

Gross operating revenues for the first 11 months of 1939 totaled $3,649,823,994, compared with $3,246,548,535 for the same period in 1938, and $4,906,580,018 for the same period in 1930, an increase of 12.4 per cent in 1939 above 1938, but 25.6 per cent below 1930. Operating expenses amounted to $2,669,203,048, compared with $2,488,875,026 for the same period in 1938, and $3,636,468,116 for the same period in 1930—7.2 per cent above the former, but 26.6 per cent below 1930.

Class I roads in the 11 months paid $332,335,470 in taxes, compared with $314,084,140 in the same period in 1938, and $328,645,340 in 1930. The November tax bill amounted to $30,567,747, an increase of $2,821,866 or 10.2 per cent above November, 1938. Sixteen Class I roads failed to earn expenses and taxes in the 11 months, of which five were in the Eastern district, five in the Southern district, and six in the Western District.

Gross for November amounted to $368,026,739 compared with $319,629,292 in November, 1938, and $394,261,533 in November, 1930; operating expenses totaled $256,170,175, compared with $231,203,840 in the same month in 1938, and $295,812,115 in November, 1930.

In the Eastern District for the 11 months the net railway operating income was $295,668,947, or 2.62 per cent; for the same period in 1938, it was $169,108,683 or 1.49 per cent, while in 1930, it was $416,555,979 or 3.78 per cent. Gross in the Eastern District for the 11 months totaled $1,790,390,985, an increase of 17.2 per cent compared with 1938, but a decrease of 26.4 per cent compared with 1930. Operating expenses totaled $1,270,469,952, an increase of 10.5 per cent above the same period in 1938, but a decrease of 29.6 per cent under the first 11 months of 1930.

For November alone the Eastern district net was $40,655,591, compared with $26,327,612 in November, 1938 and $28,102,384 in November, 1930.

Class I roads in the Southern district reported an 11-months net railway operating income of $70,912,720 or 2.47 per cent; for the same period in 1938, their net amounted to $52,290,511, or 1.83 per cent, and for the same period in 1930 it was $79,637,041 or 2.63 per cent. Gross in the Southern district for the 11 months amounted to $466,769,515, an increase of 8.9 per cent compared with the same period in 1938, but a decrease of 21.3 per cent under 1930. Operating expenses totaled $345,111,394, an increase of 5.6 per cent above the same period in 1938, but a decrease of 25.9 per cent under 1930.

November's net in the Southern district was $8,088,309, compared with $6,145,150 in November, 1938, and $6,472,898 in November, 1930.

Net in the Western district for the 11 months totaled $160,381,624, or 1.59 per cent; for the same period in 1938 those same roads had a net of $102,332,590, or 1.02 per cent, and for the same period in 1930, they had one of $324,021,032 or 3.16 per cent. Gross in the Western district for the 11 months amounted to $1,392,663,494, an increase of 7.9 per cent above the same period in 1938, but a decrease of 25.9 per cent below 1930. Operating expenses totaled $1,053,621,702, an increase of 4.1 per cent compared with the same period in 1938, but a decrease of 22.9 per cent under 1930.

For November alone the roads in the Western district had a net of $21,601,895, compared with a net of $17,219,409 in November, 1938, and $26,600,134 in November, 1930.

I. C. C. Authorizes U. P. Bus Affiliates to Merge

The Interstate Commerce Commission, Division 4, has conditionally approved the merger of the operating rights and property of Union Pacific Stages of California into the Interstate Transit Lines. Both companies are affiliates of the Union Pacific.

B. & M. Refinance Plan Made Public

President French outlines provisions of exchange plan for $136,746,500 of securities

Details of a plan of exchange whereby the Boston & Maine will seek to refinance its outstanding bonds, amounting to $136,746,500, through voluntary co-operation of its holders so that the road may avoid the impending certainty of action under Section 77 of the Bankruptcy Act or receivership, have been explained to security-owners of the road. Provisions of the plan follow in the main the general outline suggested by Jesse H. Jones, Federal Loan Administrator, late last year as a condition to further loans to the road by the Reconstruction Finance Corporation, reported in the *Railway Age* of November 11, page 763. At that time Administrator Jones characterized the road as being "close to the ragged edge" in meeting its obligations and hinted that further R. F. C. loans might be withheld unless a reduction of interest burdens were effected.

The plan, as outlined in a letter to B. & M. bond and note holders provides a basis of exchange whereby each holder of bonds (other than those held as collateral for secured notes) would receive in exchange for each $1,000 of principal amount: (1) $500 of new 4 per cent first mortgage bonds, Series RR, due 1960, or, at the holder's election, $500 in cash; and (2) $500 of new 4½ per cent income mortgage bonds, series A, due 1970. The road is subject to only one mortgage, under which all outstanding series of bonds were issued.

The amount of cash that may be paid under the option is subject to reduction, depending upon the proportion of holders who elect to take cash instead of the new first mortgage bonds. The interest on the income bonds will be cumulative to the extent of 4 per cent, and after 1940 must be paid from available net income after a capital fund for the improvement and betterment of the property and the sinking fund on the first mortgage bonds.

President French's letter also reveals that the R. F. C. has agreed that, subject to the approval of the Interstate Commerce Commission, it will provide, by the purchase at par and accrued interest of new first mortgage bonds, up to $26,000,000 cash for payment to those holders of bonds who elect to take the cash option. "This underwriting assures," Mr. French's letter continues, "that if all holders should elect to take cash there would be available at least $250 for each $1,000 principal amount of their bonds. Certain holders of bonds have already indicated their intention to take new first mortgage bonds instead of cash, so that at least $300 should be available for each $1,000 principal amount of bonds, and the railroad expects that further elections will increase the cash available for that purpose."

The plan provides that the banks that hold secured notes will take in exchange therefor an equal principal amount of new first mortgage bonds with no cash option.

The plan also provides that the secured notes held by R. F. C. will be paid in full out of the proceeds of additional new first mortgage bonds to be sold for cash to the Corporation.

J. R. Morss, vice-president, Boston Five Cents Savings Bank; L. P. Stack, assistant treasurer, John Hancock Mutual Life Insurance Company; E. C. Hirst, president, First National Bank of Concord, N. H.; T. J. Coolidge, chairman of the board, Old Colony Trust Company; and R. H. Gardiner, president, Fiduciary Trust Company, have agreed to act as a committee under the plan, to serve without compensation.

In closing, Mr. French reminds security holders that "acceptances of the plan by holders of substantially all of the bonds held by the public and by holders of all the secured notes will be necessary in order to consummate the plan on a voluntary basis. The railroad will make every effort to carry the plan into effect as a voluntary reorganization, but the responsibility for its success or failure depends upon the cooperation of each holder of bonds and of secured notes."

It is announced that the general work of solicitation, correspondence and recording will be conducted directly by officers and employees of the road under the direction of vice-president W. S. Trowbridge.

Advertising Agents to Meet January 19

The American Association of Railway Advertising Agents will hold its next annual meeting at the Union League Club, Chicago, January 19 and 20.

Inland Waterways to Move Offices

The executive offices of the Inland Waterways Corporation will be moved from Washington, D. C. to St. Louis, Mo., between January 10 and 15.

Chicagoan Carries Six Hundred

The Chicagoan of the Atchison, Topeka & Santa Fe carried 600 passengers from Kansas City, Mo. to Chicago on January 1. To accomplish this task, the five-car train was increased to 15 cars, with three Diesel-electric locomotives having a total of 5,400 hp. The patronage consisted of holiday travelers returning for Kansas City and the southwest.

Fourth-Section Relief on Canned Pineapples to Chicago

The Interstate Commerce Commission, Division 2, has granted conditional fourth-section relief in connection with rates on canned pineapples and pineapple juice, in straight carloads or in mixed carloads with other canned goods, from Pacific Coast ports to Chicago and Milwaukee, Wisc. The primary ground upon which the relief was sought, the decision points out, is "the competition of water carriers operating from those islands (Hawaiian) to one or more North Atlantic ports on published rates, thence on charter or other contract rates by way of the Hudson river, the Erie canal, and the Great Lakes to Chicago."

Commissioner Caskie, dissenting in part, would have limited the relief to shipments of pineapples and pineapple juice in straight carloads.

Contract Truckers Get More Time on I. C. C. Questionnaire

The Interstate Commerce Commission has postponed from January 15 to March 15 the deadline-date for the filing by contract motor carriers on returns to the questionnaire issued in connection with the Ex Parte No. MC-27 investigation of Central Territory contract carrier rates. The postponement came "upon consideration of petitions filed by the Interstate Contract Carriers' Association and Contract Carriers Division of American Trucking Associations, Inc."

As pointed out in the *Railway Age* of December 23, page 978, where the latter petition was noted, the filing of the returns to the questionnaire was required by the recent six-to-five decision wherein the commission also ordered that the contracts of contract carriers be opened to public inspection after April 1.

Club Meetings

The Traffic Club of Newark, N. J., will hold its next regular meeting on January 8 at the Robert Treat Hotel. The program will consist of an educational motion picture entitled "Trees and Men." The next forum of the Traffic Club will be held January 15. Miss Geraldine Kaye, director, Academy of Advanced Traffic, will give a talk entitled "Traffic and Transportation from a Woman's Viewpoint." The club also announces that its 30th Annual Dinner will be held January 30th at the Robert Treat Hotel.

The New England Railroad Club will hold its next meeting on January 9th at the Hotel Touraine, Boston, Mass. K. N. Merritt, General Sales Manager, Railway Express Agency, will address the club on "The King's Business Requires Haste." A dinner will precede the meeting at 6:30 P. M.

Retirement Certifications and Terminations in November

New employee annuities certified to the Treasury by the Railroad Retirement Board in November totaled 2,142 and amounted to $135,388 a month. This was the largest number of new annuities certified since May.

During November, 585 annuities which amounted to $38,620 were terminated by death. After adjustments for terminations, other than by death, recertifications, and reinstatements, there were 97,009 employee annuities amounting to $6,355,231 in force at the end of the month.

Also, during November, 358 pensions amounting to $20,142 were terminated by death. The number of pensions in force at the end of that month, after allowance for terminations and adjustments, was 37,872 and amounted to $2,213,312 a month.

Meanwhile, 58 new survivor annuities which amounted to $1,664 a month were certified and five amounting to $192 a month were terminated by death. The total number of survivor annuities in force at the end of the month, after adjustments, was 2,024 and the monthly amount payable on them was $68,149.

There were 114 new death benefit annuities amounting to $3,955 a month certified during November, two amounting to $60 a month terminated by death, and 130 amounting to $4,600 terminated by completion of the 12-month period during which such annuities are payable. This brought the number of death benefit annuities in force at the end of November to 717 on which the monthly amount payable was $25,069.

I. C. C. Refuses Special Treatment to C. C. C. Enrollees

The Interstate Commerce Commission, in an eight to three decision, has affirmed the order of Division 3 in which it found not justified the proposed establishment of reduced passenger fares for the exclusive use of enrollees of the Civilian Conservation Corps traveling on furlough or leave at their own expense. The ruling was without prejudice to the filing of schedules which would accord such reduced fares to all other persons in similar circumstances. The railroads had previously attempted to offer such reduced rates by relying on that section of the Interstate Commerce Act permitting them to give reduced rates to indigent persons or inmates of charitable institutions.

Commissioner Lee concurred in part, while Commissioner Alldredge wrote a dissent which was concurred in by Chairman Eastman and Commissioner Caskie.

The Canadian Roads in November

The Canadian National in November had net operating revenues of $4,974,604 as compared with $2,133,340 in November, 1938. Operating revenues ($20,584,777) were up $3,799,693 and expenses ($15,610,-173) were $1,666,353 higher.

For the eleven months the C. N. R.'s operating net was $17,080,805 (an increase of $12,043,934). Total operating revenues for the eleven months were $184,773,869 (up $17,716,198) and operating expenses were $167,693,064 (up $5,672,264).

The Canadian Pacific earned $5,592,275 operating net in November (as compared with $4,029,480 in November, 1938). Gross in November was $15,437,306 (up $2,407,-462) and expenses were $9,845,031 (up $844,668)).

For the eleven months C. P. R. gross has been $137,549,530 and expenses $113,407,680 (up $7,239,004 and $503,858 respectively). Net operating revenues were $24,141,850 for the eleven months (increase, $6,735,-145).

Panama Limited Collides with Louisiane

The northbound Panama Limited of the Illinois Central ran into the rear of the Louisiane at Arcola, Ill., at 6 a. m. on January 1, killing one passenger and injuring several persons of whom nine passengers and four employees required hospitalization. The Louisiane, which had made a flag stop at Arcola, had gotten under way and had attained a speed of 15 m.p.h. when it was struck by the Panama Limited which was traveling at 45 m.p.h. when the Louisiane was sighted. The im-

Continued on second left-hand page

Make 1940

—FOR EARNINGS—

"Union" Centralized Traffic and Remote Control installations have speeded up traffic, eliminated delays, increased safety, and effected savings.

EVERY effort will be made by the railroads to maintain the present upward traffic trend during 1940 by providing still greater efficiency, speed and safety. This speeding of traffic will be accomplished by keeping trains on the road less time and thus meeting with the approval of the public by shortening traveling and shipping time.

An important factor in this accomplishment will be the installation of "Union" modern signal systems. Statistics prove that with an increase in signal installations, all of these desirable accomplishments are effected. Modern signal systems pay dividends in increased safety, expedited traffic, operating efficiency, and substantial savings from the moment they are placed in service.

—FOR OPERATING IMPROVEMENTS—

"Union" Electro-Pneumatic Car Retarders are speeding traffic, not only in the retarder equipped classification yards, but on entire railroads. Deliveries are made several hours earlier.

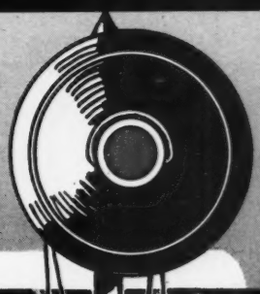
ONCE again the statistics show that the railroads have progressively improved operating efficiency. This has been true year after year, and the railroads are to be congratulated upon this achievement.

Let's analyze these statistics: In practically every item, it will be found that signaling had either a direct bearing upon, or was partially responsible for, the improvement. Modern signal systems put trains over the road quicker and safer. This means fuel economy—overtime economy—expedited service and customer good-will.

UNION SWITCH & SIGNAL COMPANY

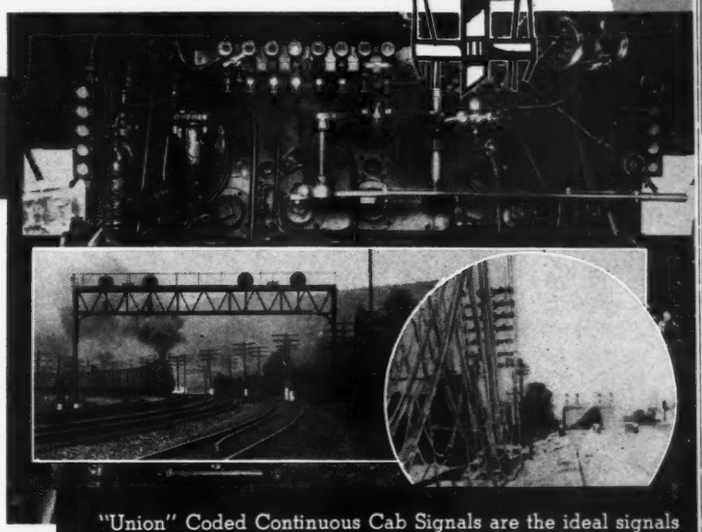
SWISSVALE, PA.

a Signal Year—



—FOR SAFETY—

THE remarkable safety statistics, piled up year after year by the railroads, are cumulative testimonials of the efficacy of modern signal systems. Without signal systems, such outstanding safety achievements, notwithstanding the existing increased speeds, could not have been accomplished. Speed, with safety, requires signal systems, and by no other method can trains be put over the road as quickly or safely. Consider, for example, the roads equipped with "Union" Coded Continuous Cab Signals; regardless of weather conditions, such as fog, sleet, snow, dust, ice or rain—trains thus equipped are enabled to maintain schedule speed with safety.



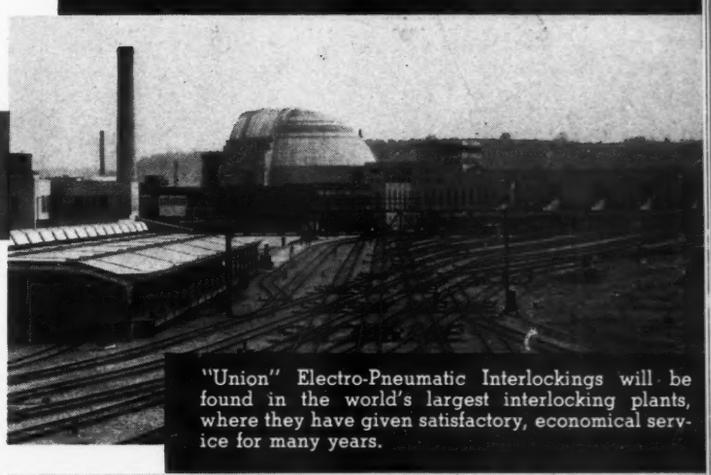
"Union" Coded Continuous Cab Signals are the ideal signals for today's high-speed trains. They enable maintenance of schedules in all weather conditions. Enginemen are *instantly* advised of changed track conditions ahead and can take immediate action.

"Union" Coded Track Circuit Control for wayside signals eliminates line wires and has many other outstanding advantages.

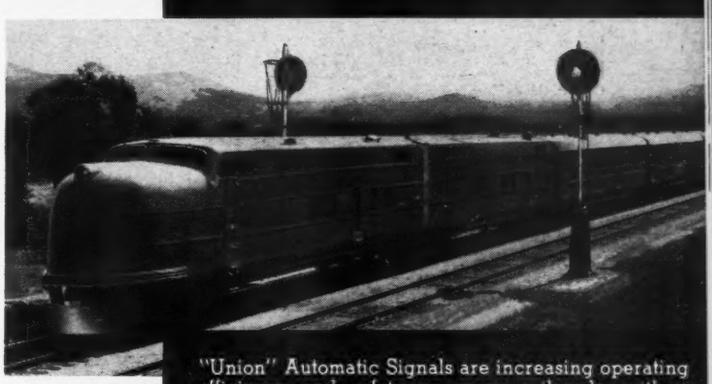
—FOR ECONOMY

IMPORTANT advantages and economies have been effected by modern signal systems. These economies have been widely publicized and have been periodically reported by various Committees of the A.A.R. Such economies become cumulative and will, undoubtedly, be reflected in the 1940 operating statistics in increased net earnings. Signal systems start paying dividends from the moment they are placed in service.

The engineering staff of the Union Switch & Signal Company is at your service to explain how "Union" modern signal systems can help make 1940 a Signal year for *Earnings*, for *Operating Improvements*, for *Safety* and for *Economy*. Consult the nearest office.



"Union" Electro-Pneumatic Interlockings will be found in the world's largest interlocking plants, where they have given satisfactory, economical service for many years.



"Union" Automatic Signals are increasing operating efficiency and safety on many railroads, with a substantial return on the investment from the savings effected.

NEW YORK SAN FRANCISCO

CHICAGO ST. LOUIS

pact damaged the ends of the three rear sleeping cars of the Louisiane and the locomotive, tender, club car and first sleeping cars of the Panama Limited.

In the territory where the accident occurred, trains are operated right and on double track which is protected with continuous automatic train stop with cab signals, no wayside automatic block signals being provided in this territory. The train control and cab signal apparatus on the locomotive of the Panama Limited had failed north of Centralia and the failure had been reported from Odin. The dispatcher had authorized the train to proceed and had advised the engineman and conductor of the Louisiane that the Panama Limited was following "without train control."

Freight Car Loading

Loading of revenue freight for the week ended December 23, totaled 654,817 cars, according to the Association of American Railroads. This was a decrease of 26,349 cars or 3.9 per cent below the preceding week, an increase of 80,619 cars or 14 per cent above the corresponding week in 1938 and an increase of 196,996 cars or 43.0 per cent above the same week in 1937.

The summary as compiled by the Car Service Division, A. A. R., follows:

Revenue Freight Car Loadings

For Week Ended Saturday, December 23

Districts	1939	1938	1937
Eastern	146,573	125,852	98,730
Allegheny	141,193	107,825	82,372
Pocahontas ...	47,850	42,035	29,845
Southern	99,360	90,508	71,678
Northwestern .	74,571	68,963	55,478
Central Western	98,019	94,644	79,797
Southwestern .	47,251	44,371	39,921
Total Western Districts ...	219,841	207,978	175,196
Total All Roads	654,817	574,198	457,821
Commodities			
Grain and Grain Products	32,702	30,725	27,419
Live Stock....	11,416	11,997	9,541
Coal	141,891	133,490	101,829
Coke	12,086	6,636	4,870
Forest Products	31,711	27,614	20,449
Ore	11,811	9,001	7,002
Merchandise l.c.l.	144,518	140,909	119,434
Miscellaneous .	268,682	213,826	167,277
December 23..	654,817	574,198	457,821
December 16 ..	681,166	606,003	600,283
December 9....	687,265	618,964	619,266
December 2....	688,888	648,534	620,325
November 25..	676,516	561,658	555,762
Cumulative Total, 51 Weeks 33,552,489		29,957,623	37,215,558

In Canada.—Carloadings for the week ended December 23 were 45,903, as compared with 48,343 in the previous week and 38,494 in the comparable 1938 week, according to the compilation of the Dominion Bureau of Statistics.

Total for Canada	Total Cars Loaded	Total Cars Rec'd from Connections
Dec. 23, 1939....	45,903	26,502
Dec. 16, 1939....	48,343	27,401
Dec. 9, 1939....	50,390	26,531
Dec. 24, 1938....	38,494	20,605
Cumulative Totals for Canada		
Dec. 23, 1939....	2,512,090	1,180,758
Dec. 24, 1938....	2,401,664	1,055,996
Dec. 25, 1937....	2,591,329	1,335,600

Retirement Board Analyzes Employee Compensation

An increase in the average credited compensation of employees of Class I railroads in 1938 of 15.5 per cent over the figure for 1937 is attributed by the Railroad Retirement Board to an increase in the average amount of service, increases in wage rates in August and October, 1937, and a reduction in the proportion of maintenance of way employees. The latest issue of the "Weekly Review" of the Board shows that this increase was brought about through a reduction in the proportion of total employees with annual compensation below $300 and an increase in the proportion of total employees with an annual compensation of $300 or over.

The Retirement Board's figures show that the 1,325,973 employees of Class I railways with creditable compensation earned in 1938 an average of $1,280, which was an increase of 15.5 per cent above the 1937 figure. The average wage of those employees who had employment in each of the year's 12 months was $1,824, or a 2.5 per cent increase over 1937. The $1,280 figure compares with a $1,101 for 1937 which was railway labor's favorite annual wage figure in the statistical battles during the 1938 emergency board hearings on the proposed 15 per cent cut in wages.

The Retirement Board further points out that of the 1,325,973 employees working in 1938, 132,770 or 10.1 per cent earned less than $50 a year, which compares with 16.6 per cent for 1937. In the class earning $1,500 to $1,749, there were 122,345 or 9.3 per cent as contrasted with 8.7 per cent in 1937; while in the $1,750 to $1,999 class 115,209 or 8.8 per cent were employed as compared with 8.2 per cent in 1937.

Post Office is Large User of the Rails

On June 30, 1939, mails were carried under authorizations of the Post Office Department by 319 companies over 183,478 miles of railroads, according to the annual report of Postmaster General James A. Farley. The report further points out that the annual mileage of the regularly authorized space units of the several sizes for carrying mails was 455,954,544.

The regular appropriation for the fiscal year for inland transportation by railroad routes and mail-messenger service was $107,900,000, from which amount the sum of $150,000 was transferred to the appropriation for "Star Route Service, 1939", under authority contained in the Second Deficiency Appropriation Act, fiscal year 1938, approved June 25, 1938, and $1,000,000 to the appropriation for "City delivery carriers, 1939", under authority contained in the Urgent Deficiency and Supplemental Appropriation Act, fiscal years 1939 and 1940, approved June 30, 1939, leaving $106,750,000 available for this service for the fiscal year 1939.

The expenditures for the fiscal year were as follows: Mail transportation by railroads, $98,589,476; mail-messenger service, $6,931,534; other items chargeable to the appropriation, $755,000; total, $106,276,010 (small part estimated), an increase of $1,211,350 as compared to the preceding year.

Both the domestic and foreign air mail systems were improved and extended during the fiscal year 1939, the report says. There were 52,193,772 miles flown by planes on domestic air mail routes on a mileage pay basis, and 5,357,483 miles on United States foreign air mail routes—a total of 57,551,255 miles for the entire service. This exceeded by 12.49 per cent the miles flown with pay during the fiscal year 1938 and by 29.61 per cent the record of any previous year. The report goes on to say that the route mileage of the domestic system at the end of the fiscal year totaled 37,049 miles and that of the foreign system 31,478.9 miles—a total of 68,527.9 miles.

Shippers' Boards Forecast First-Quarter Loadings

Freight carloadings in this year's first quarter are expected to be about 12.1 per cent above the actual loadings of the same quarter last year, according to estimates compiled by the 13 Shippers Advisory Boards and noted briefly in last week's issue.

Below is the tabulation showing actual loadings for each district in the first quarter of 1939, the estimated loadings for the first quarter of 1940, and the percentage of increase or decrease:

Shippers Advisory Boards	Actual Loadings First Quarter 1939	Estimated Loadings First Quarter 1940	Per Cent Increase
New England ...	110,280	116,606	5.7
Atlantic States ..	502,863	555,848	10.5
Allegheny	652,738	776,378	18.9
Ohio Valley	599,103	668,979	11.7
Southeast	537,900	600,514	11.6
Great Lakes	287,575	350,378	21.8
Central Western..	173,744	177,843	2.4
Mid-West	692,308	781,713	12.9
Northwest	133,865	171,290	28.0
Trans-Missouri-Kansas	259,016	271,701	4.9
Southwest	294,751	294,036	0.2*
Pacific Coast ...	181,756	203,520	12.0
Pacific Northwest.	144,573	154,421	6.8
Total 4,570,472		5,123,227	12.1

* Decrease.

The 13 Shippers' Advisory Boards, according to the estimates, expect an increase in the first quarter of 1940, compared with the same period one year ago in the loading of all of the 29 commodities. Among those showing the greatest increase are the following: Cotton, 73.8 per cent; iron and steel, 45.3 per cent; ore and concentrates, 40.8 per cent; machinery and boilers, 24.8 per cent; agricultural implements and vehicles, other than automobiles, 21.4 per cent; automobiles, trucks and parts, 18.8 per cent; paper, paper board and prepared roofing, 15.6 per cent; grain, 11.9 per cent; lime and plaster, 11.7 per cent; chemicals and explosives, 10.4 per cent; gravel, sand and stone, 10.2 per cent; lumber and forest products, 9.8 per cent; coal and coke, 9.4 per cent; cotton seed and products, except oil, 9 per cent; hay, straw and alfalfa, 8.8 per cent; brick and clay products, 7.4 per cent; cement, 6.4 per cent; poultry and dairy products, 6.1 per cent; flour, meal and other mill products, 5.7 per cent; canned goods, 5.4 per cent; fertilizers of all kinds, 5.4 per cent; and potatoes, 5.1 per cent.

November Truck Loadings 23.8 Per Cent Above 1938

November truck loadings, 5.3 per cent below the October volume, were nevertheless 23.8 per cent above November, 1938, according to the American Trucking Associations' monthly survey. The A. T. A. index, based on the 1936 monthly average

as 100, stood at 144.1 in November as compared with 151.26 in October and 117.37 in November, 1938.

"In their reports," the A. T. A. statement says, "the carriers indicated that continued labor difficulties at their customers' plants were largely to blame for the November drop in truck loadings."

The survey was based on comparable reports of 213 carriers in 37 states. They transported 1,207,274 tons of freight in November, as against 1,274,316 tons in October and 975,326 tons in November, 1938.

General merchandise, accounting for 75 per cent of the total tonnage reported for November, decreased seven per cent below October but rose 25.9 per cent above November, 1938. Petroleum products, which represented slightly less than 10 per cent of the total reported, dropped 2.8 per cent under October's loadings, but increased 22 per cent over November, 1938, and 55 per cent above the 1936 monthly average.

The only increase over October's tonnage was reported by carriers transporting automobiles. Representing 4.5 per cent of the total tonnage reported, movement of automobiles in November increased 21 per cent above the preceding month and 22.8 per cent above November, 1938. Iron and steel, 4.5 per cent of the total reported, decreased 3.2 per cent under October and 5.8 per cent under November, 1938. Carriers transporting iron and steel attributed the decrease to a seasonal decline.

Slightly more than 6 per cent of the total freight reported was miscellaneous commodities, including tobacco, textile products, cement and household goods. While carriers in this group reported a decrease of 4.6 per cent below October, the tonnage reported was an increase of 30.3 per cent above November, 1938, and 34.1 per cent higher than the 1936 monthly average.

Trucking Industry's Best Year, Says Rodgers

The trucking industry in 1939 enjoyed the most profitable year in its history, according to Ted V. Rodgers, president of the American Trucking Association. Tonnage since July scored new monthly peaks, reaching an all-time record in October.

"The increase in business generally," Mr. Rodgers said, "gives promise that we well may expect top truck loadings through the Spring months. Handling of the increased tonnage in 1939 required more trucks and more workers. Increases in employment and number of vehicles corresponded closely with increases in the amount of freight transported.

"Legislative records of the past year served to give truckmen new hope that the trend toward anti-truck laws is at last being stemmed. In the 44 state legislatures which were in session in 1939, approximately 11,000 bills affecting highway users were introduced. About 1,200 of them were enacted. Only a very small portion of the new laws can be said to be unfavorable to the trucking industry. On the other hand, many favorable laws were placed on the statute books. Outstanding among them were increases in allowable weights for trucks, particularly in southern states where they were unduly restrictive, more liberal licensing provisions and constitutional prohibitions against diversion of highway funds.

"In 1940, the trucking industry will inaugurate its first nation-wide public relations campaign. The activity will center chiefly on the service the industry is affording the public and the part it is playing in reducing highway accidents. The safety activities of the 50 affiliates of A. T. A. will be coordinated nationally under a comprehensive program which will include driver training, courtesy and first-aid work.

"Within the last year, several thousands of commercial drivers completed Red Cross courses in first aid. Their trucks are equipped with the apparatus necessary to give assistance to injured persons. We hope our drivers, because of this training, will be responsible for saving the lives of many accident victims."

Rivers and Harbors Work in 1939 Fiscal Year

Reporting for the fiscal year ended June 30, 1939, on the civil activities of the Corps of Engineers, Secretary of War Woodring notes that expenditures for rivers and harbors and flood control work during the period under review totaled $199,426,335. Also, he reported that the Panama Railroad Company earned a net profit of $1,387,560 as compared with $1,347,737 for the previous fiscal year ended June 30, 1938.

Looking upon the War Department's rivers and harbors work, Mr. Woodring finds it good. "The improvement of waterways for navigation, inaugurated by the federal government in 1824," he says, "furnishes an indispensable avenue for the improvement of commerce. Traffic on our improved channelways for the calendar year 1938 amounted to 466,900,000 tons, valued at $17,019,000,000. The value of one year's water-borne traffic has added significance when it is realized that the cost of maintenance of the waterways for the year amounted to about two tenths of one per cent of the commerce value."

Among the more important projects listed by Secretary Woodring is the improvement of the Upper Mississippi to provide for nine-ft. navigation to Minneapolis by the construction of 26 locks and dams, which is 84 per cent completed; channel work on the Missouri to provide for six-ft. navigation to Sioux City, which is 75 per cent completed; the Fort Peck dam, which was advanced to 85 per cent completion; and the "modern locks and dams" on the Illinois Waterway at La Grange, Ill., and Peoria, which were completed during the year. Also completed was the new lock and dam No. 9 on the Allegheny at Riverton, Pa., while the work of maintaining the Ohio's nine-ft. channel went on.

The section on the Panama Canal reveals that during the year under review the revenues from operations of the canal itself totaled $23,806,343, while the operating expenses were $9,965,272 and the net income $13,841,071. The latter was increased to $14,522,343 by the addition of the $681,272 net from the business operations of the canal. The Panama Railroad Company's net income is given above; its gross was $15,880,444, received from the operation of the rail line, docks, coaling plants, commissaries, etc., on the Isthmus, and from the operation of the steamship line running between New York and the Isthmus.

Port Plan Working Smoothly, Pelley Reports

Despite an increase through the port of New York in the past two months of 10 per cent in the number of cars loaded with export freight, those cars "are now being handled more expeditiously at destination and unloaded faster" since a plan was established by the railroads early in November to control the movement of export traffic at Atlantic and Gulf ports to the extent necessary to prevent congestion, J. J. Pelley, President of the Association of American Railroads, reported to the board of directors of that Association at their December 29 meeting in Washington, D. C.

Mr. Pelley pointed out that with the cooperation of the shippers, exporters, steamship owners and port authorities, a steady flow of export traffic is being moved by the railroads through all ports without difficulty and without congestion.

"In the first 20 days of December," he said, "a daily average of 745 cars of export freight was loaded on lighters in the New York harbor and placed along side steamships so that the freight could be unloaded directly on to the boat. This was an increase of 10 per cent compared with a daily average of 685 cars in November. On November 1, there was a delay of 48 hours or more in the unloading of freight from 147 lighters, but on December 20, despite the increase in traffic for export, there were only 94 lighters which had been delayed 48 hours or more, or a decrease of 36 per cent.

"Reports received by G. C. Randall, Manager of the Car Service Division in Charge of Port Traffic, showed that on December 22, there were 3,011 cars of miscellaneous freight being held at the principal Atlantic and Gulf ports for unloading, compared with 3,656 cars on December 5. Moreover on December 22, an average of 727 cars was being unloaded daily at those ports compared with a daily average of 588 on December 5.

"Since the establishment early in November of the plan for controlling the movement of export rail traffic to those ports, it has been necessary to exercise control over the movement of freight in only one instance and that affected only bulk grain and soy beans at New Orleans, owing to limited elevator space. With the cooperation of the elevator operators, however, the shipments for which elevator space was not available were later unloaded and the cars released. Since then, more than 200 cars of grain have been authorized to be moved into New Orleans and additional grain will be accepted as rapidly as ships are available to transport the grain from that port. In order to control the movement of grain at that point, the Federal Barge Lines, as well as those of privately owned companies, are cooperating with the railroads.

"There are not at the moment any other situations at any port where the necessity

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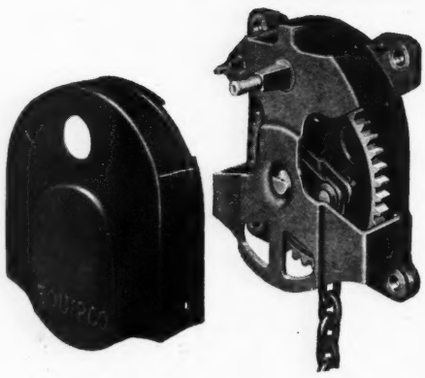
You don't need a safecracker to see the mechanism of this brake –



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The Equipco is truly a ***safety*** hand-brake, because the exclusive ***removable housing*** opens to full view every single vital part of the mechanism. The job can be done easily and quickly without the necessity of shopping the car or taking the brake unit off, or dismantling the brake. Removing two small bolts releases the housing and the entire gearing and all other parts may be readily inspected, without difficulty or loss of time.

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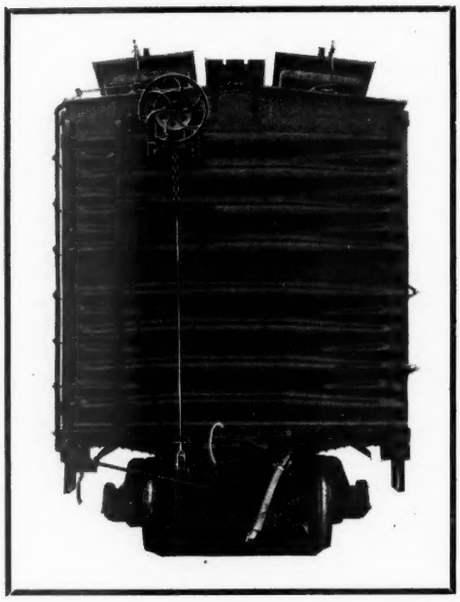

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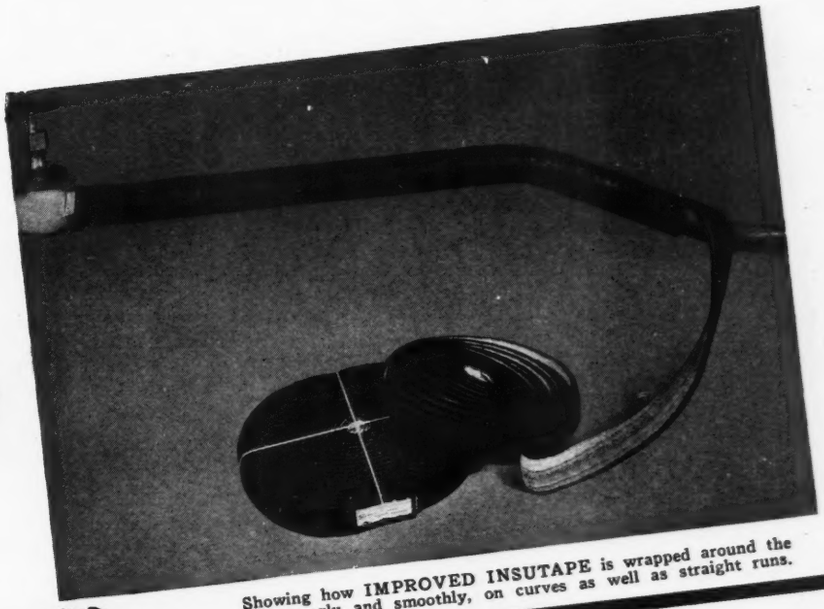

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310 SOUTH MICHIGAN AVENUE - - CHICAGO, ILLINOIS

appears imminent for exercising full control provided for in the plan. With the full cooperation of shippers, exporters, boat lines, port authorities, and all others interested, the unloading of export freight is being greatly expedited and the freight cars returned more promptly to active service.

"Under the plan now in operation, there is no restriction on the movement by rail of freight for export to Atlantic and Gulf ports so long as facilities are provided whereby such freight can be loaded promptly on to ships or into warehouses and thus avoid freight cars being used for storage purposes. We believe that the ground work has been laid for a plan which will effectively avoid the possibility of difficulties similar to the ones which became so serious during the World War."

City of San Francisco Wrecked by Sabotage

(*Continued from page 107*)

would be unable to detect the damaged track condition.

About three hours intervened between the passage of the last prior train and train No. 101. It was developed by tests that only a comparatively short time was required to disconnect a rail joint, draw the spikes, and realine a rail as had been done in this case.

When the power units became derailed on the curve, the first power unit traveled to the left a few inches, because of following a tangential line. However, the motor housings and the pedestal binder-bolts prevented the power unit from leaving the roadbed.

Performance of the Equipment

The cars involved in this accident were constructed, for the most part, of aluminum alloy. As shown by the records, these cars were designed and constructed in accordance with the requirements of the Post Office Department specifications for railway mail cars; the underframes were designed to withstand a buffing stress of 400,000 lb. The Postal Department specifications require a safety factor of two in the calculation of buffing stresses, fixing the minimum for actual failure because of buffing shock at 800,000 lb.

To determine that the requirements of these specifications were complied with, the manufacturer apparently relied upon calculations and results of tests of a section of underframe similar to that of the cars in the "City of San Francisco." This section was 7 ft. 10 in. long and withstood a compression test of 880,000 lb. before permanent deformation occurred. After the accident, on September 17, similar tests were made at the Pullman-Standard Car Manufacturing Company laboratory; a section of frame removed from the car "Twin Peaks" (unit No. 9 in the train) was used and the results indicated that the material was in accordance with the specifications.

On October 3, the Aluminum Company of America, at its laboratory, conducted tests on a portion of the center-sill removed from the car "Twin Peaks," using a piece near the point where a fracture had occurred. The results of this test demonstrated that the material was well above the minimum requirements.

These cars withstood impact shock up to a certain degree, beyond which there was practically a total collapse; there appeared to be no intermediate stage of damage. A great amount of damage to the superstructure was sustained by the cars involved in this accident, especially those where the most fatalities occurred. The aluminum alloy sheathing, which forms a part of the girder construction of the car sides, manifested a tearing characteristic, in that the metal tore loose readily from the rivets; also, it was cut and torn badly because of being dragged on the ballast. There was but little indication of dispersion of strain. In many instances a badly torn section was adjacent to one that did not buckle in the slightest degree.

Any attempt to draw conclusions as to what might have occurred if standard all-steel passenger cars had been involved in this accident would be purely conjectural and speculative.

The conclusions of the Bureau were stated in the following single sentence:

"This accident was caused by malicious tampering with the track."

Highway and Grade Crossing Funds Apportioned

Federal Works Administrator John M. Carmody has apportioned among the 48 States, the District of Columbia, Hawaii and Puerto Rico, $156,000,000 for highway improvement and elimination of hazards at railroad grade crossings, available from appropriations authorized for the fiscal year beginning July 1, 1940, after deductions of amounts authorized for administrative expenses.

The apportionment was authorized by the Act of June 8, 1938, which provided $115,000,000 for improvement of the Federal-aid system and its extensions through cities, $15,000,000 for improvement of secondary or feeder roads, and $30,000,000 for elimination of hazards at railroad grade crossings.

The highway funds were apportioned among the States in proportion to population, area, and mileage of rural post roads. Grade crossing funds were apportioned, one-half on the basis of population, one-fourth on the basis of mileage of the Federal-aid system, and one-fourth according to railroad mileage. It is provided that no State shall receive less than one-half of one per cent of an apportionment.

Expenditure will be under the supervision of the Public Roads Administration of the Federal Works Agency, formerly the Bureau of Public Roads in the Department of Agriculture.

"These funds," Mr. Carmody said in announcing the allocations, "make possible a continuation of the Federal-aid program on substantially the same scale as in the past fiscal year." In that year the work in cooperation with State highway departments resulted in the improvement of 9,786 miles on rural portions of the Federal-aid system, 2,971 miles on the secondary or farm-to-market systems, and 725 miles were improved in municipalities. In the program of grade crossing elimination and protection, 382 crossings were eliminated, and 86 obsolete elimination structures were reconstructed.

Mr. Carmody also announced the apportionment of $2,000,000 to be expended in the 13 public lands States for construction of roads through public lands and Federal reservations.

The apportionment of grade crossing funds follows:

State	Grade Crossings
Alabama	$589,270
Arizona	191,626
Arkansas	510,125
California	1,111,429
Colorado	376,426
Connecticut	248,548
Delaware	146,250
Florida	416,288
Georgia	733,109
Idaho	242,861
Illinois	1,544,707
Indiana	758,563
Iowa	819,207
Kansas	756,758
Kentucky	534,074
Louisiana	464,383
Maine	202,164
Maryland	300,034
Massachusetts	610,114
Michigan	970,387
Minnesota	783,436
Mississippi	465,023
Missouri	890,471
Montana	396,693
Nebraska	522,486
Nevada	146,250
New Hampshire	146,250
New Jersey	584,751
New Mexico	248,930
New York	2,000,719
North Carolina	754,096
North Dakota	462,007
Ohio	1,249,549
Oklahoma	685,148
Oregon	335,220
Pennsylvania	1,690,736
Rhode Island	146,250
South Carolina	444,883
South Dakota	401,477
Tennessee	559,502
Texas	1,630,426
Utah	193,595
Vermont	146,250
Virginia	558,591
Washington	450,343
West Virginia	391,518
Wisconsin	725,347
Wyoming	197,023
District of Columbia	146,250
Hawaii	146,250
Puerto Rico	224,207
Total	$29,250,000

Supply Trade

The Square D Company, Detroit, Mich., has bought the **Kollsman Instrument Company.** At present Kollsman's manufacturing will remain at the Kollsman plant in Elmhurst, N. Y.

The **J. O. Nessen Lumber Company** and the **Marsh & Truman Lumber Company,** both of Chicago, have been combined and are being operated as the **Marsh & Truman Lumber Company.**

Arthur E. LeGare, sales engineer of the **General Steel Castings Corporation** at Granite City, Ill., has been transferred to Chicago, from which he will handle the same territory as heretofore.

Harry Glaenzer, for 18 years vice-president in charge of engineering of **The Baldwin Locomotive Works,** tendered his resignation, effective January 1, because of ill health, which resignation has been accepted by the board of directors of

Continued on next left-hand page

Check water treatment on these points

PREVENTION OF INCRUSTATION IN INJECTORS, BRANCH PIPES AND FEED WATER HEATERS.

"Limed-Up" injectors and branch pipes, scaled heaters, incrusted [illegible] lines—expensive nuisances if not actual cause of failures—effectively eliminated with Nalco chemicals.

REDUCTION OF FOAMING TENDENCY.

"Light Water," scored valves and steam cylinders, foaming failures and costly road delays—eliminated by means of systematic controlled blowdown either manual or automatic and Nalco chemicals which actually reduce foaming tendency.

PREVENTION OF PITTING AND CORROSION.

"Ringed" and pitted tubes and flues, corroded sheets, burst flues—expensive wasting away of good boiler materials—eliminated with Nalco chemical treatments.

SCALE ELIMINATION — (CARBONATE, SULPHATE, PHOSPHATE AND SILICATE).

"Mud banks," scale pockets, burned flues, blistered sheets causing costly replacements and renewals—prevented through use of Nalco chemicals and controlled system of treatment.

PREVENTION OF CAUSTIC EMBRITTLEMENT.

"Leaky seams," cracked shells and sheets—dangerous and insidious weakening of boiler plate due to caustic embrittlement—more prevalent due to higher boiler operating pressures—prevented through use of special Nalco chemicals and controls.

Nalco covers the field of water treatment completely and economically

NATIONAL ALUMINATE CORPORATION

PAIGE-JONES CHEMICAL COMPANY

6216 West 66th Place Chicago, Illinois

NALCO SYSTEM OF WATER TREATMENT

that company with sincere regret. A photograph and sketch of Mr. Glaenzer were published in the *Railway Age* of April 15, 1939, page 678.

The Ardco Manufacturing Company has moved its office from 1 Newark street, Hoboken, N. J., to 137-143 Franklin street, Jersey City, N. J. At the new address they will combine their office with their manufacturing facilities which include locomotive drifting valves, cylinder cocks and rail lubricators.

Dr. William A. Mudge has joined the technical service division of the New York office of **The International Nickel Company, Inc.,** according to an announcement made by **A. J. Wadhams,** vice-president and manager of the development and research division. For the past 17 years, Dr. Mudge has been superintendent of research, superintendent of the refinery and works metallurgist at the company's Huntington, W. Va., Rolling Mill and previously, for two years was at the company's Bayonne, N. J., refinery, where he joined International Nickel in 1920.

Herbert J. Watt has been appointed manager of sales for the central area of the **Carnegie-Illinois Steel Corporation.** Mr. Watt will co-ordinate sales activities of Carnegie-Illinois offices at Pittsburgh, Pa., Cleveland, Ohio, Cincinnati and Detroit, Mich. His headquarters will be at the general offices in the Carnegie building, Pittsburgh. Mr. Watt entered the steel industry in the Philadelphia office of Carnegie Steel Company in 1912 and in 1917 was transferred to the Washington office of United States Steel Corporation Subsidiaries. He was formerly assistant general manager of sales for the Jones & Laughlin Steel Corporation.

Walter Chadwick, executive vice-president of the Davenport Besler Corporation, Davenport, Iowa, has been elected president, to succeed **Charles Pasche,** deceased. Mr. Chadwick graduated from the University of Illinois in 1905, and since that time has been identified with railroad and locomotive building activity. He began his railroad career with the Chicago, Burlington & Quincy at Aurora, Ill., where for three years he engaged in special apprenticeship work. Later he entered the employ of the Davenport Locomotive Works (now the Davenport Besler Corporation) and after 20 years with the company resigned from the position of sales manager to become vice-president of the Clapp-Riley and Hall Equipment Company, Chicago. In 1937, he returned to the Davenport Besler Corporation as executive vice-president.

Walter Chadwick

Frank T. Kalas, who has been elected third vice-president of the **Electric Storage Battery Company,** Philadelphia, Pa., as was announced in the *Railway Age* of December 30, began work with this company and soon earned promotion. He served as a salesman, then as Washington branch manager, and later consecutively as district manager, assistant general sales manager, and general sales manager, the position he held at the time of his election as third vice-president of the same company. Mr. Kalas has had a long experience in all fields of storage battery application and will direct the sales activities of the company as vice-president and general sales manager.

Frank T. Kalas

O. M. Bernuth, president of the **Bernuth-Lembcke Company,** New York, has been elected also president of the **Chipman Chemical Company,** Bound Brook, N. J., effective January 1, the latter company having become a wholly-owned subsidiary of the Bernuth-Lembcke Company. Mr. Bernuth succeeds **R. N. Chipman,** who has resigned. **Charles Bernuth** has been appointed assistant to the president of the Chipman Chemical Company at Bound Brook, and **Warren H. Moyer,** secretary and treasurer of this concern, has become vice-president and treasurer, with headquarters as before at Bound Brook. **D. P. Webster** continues as vice-president and **W. R. Evans** as assistant treasurer of the Chipman Chemical Company.

OBITUARY

Edwin W. Allen, vice-president of the General Electric Company, died on January 1, in the Johns Hopkins Hospital, Baltimore, Md. Mr. Allen was 60 years of age at the time of his death.

Financial

ALGERS, WINSLOW & WESTERN.—*Debentures.*—This company has been authorized to issue $125,000 of six-year 4½ per cent serial debentures to be sold at 97¾ and accrued interest, and the proceeds used to retire certain securities, provide for additions and betterments and purchase some equipment. The debentures have been sold at 97¾ and accrued interest to the Standard Securities Corporation, of Winchester, Ind., making the average annual cost to the company approximately 5.24 per cent.

BALTIMORE & OHIO.—*Pledge of Bonds.*—This company has asked the Interstate Commerce Commission to modify its order of November 10, 1937, so as to extend until December 31, 1941, the period within which it may pledge all or any part of $5,000,000 of refunding and general mortgage six per cent bonds, series C, as collateral for any short-term borrowing which it may decide to do.

BALTIMORE & OHIO.—*Notes.*—Division 4 of the Interstate Commerce Commission has modified its order of September 15 so as to authorize this company to extend until November 8, 1944, the maturity date of $2,955,000 of four per cent serial collateral five-year notes held by the Reconstruction Finance Corporation. The commission's order had authorized an extension of five years from the effective date of the company's interest adjustment plan, but not later than August 1, 1944; and the present order brings the original order into conformity with the court decree which has the effect of extending the maturity until the above-mentioned November 8, 1944, date.

CHESTERFIELD & LANCASTER.—*Decree of Foreclosure and Sale.*—The federal district court at Charleston, S. C., has issued a final decree of sale and foreclosure of this road. A 32-mile line operating between Cheraw and Pageland, the short line is operated by L. R. Powell, Jr., and H. W. Anderson, receivers for the Seaboard Air Line. The foreclosure action was instituted on a bond issue of $186,000 on which accrued unpaid interest amounts to $187,317. It is reported that an upset price of $31,700 has been set for the property.

FLORIDA EAST COAST.—*Protective Committee.*—Roland D. Baldwin and Clifford G. Schultz of Jacksonville, Fla., and Edwin H. Woarms of New York City have asked the Interstate Commerce Commission for authority to act as a protective committee and solicit and act in that connection in the receivership of this company.

LOUISVILLE & NASHVILLE.—*Bonds.*—This company has asked the Interstate Commerce Commission for authority to extend the maturity date of $60,000,000 of its unified 50-year, four per cent gold mortgage bonds, maturing July 1, 1940, under its mortgage of June 2, 1890—$30,000,000 to January 1, 1950, with a reduction in the interest rate from four to 3½ per cent, and $30,000,000 to January 1, 1960, at the regular rate of four per cent.

At the same time the company requested

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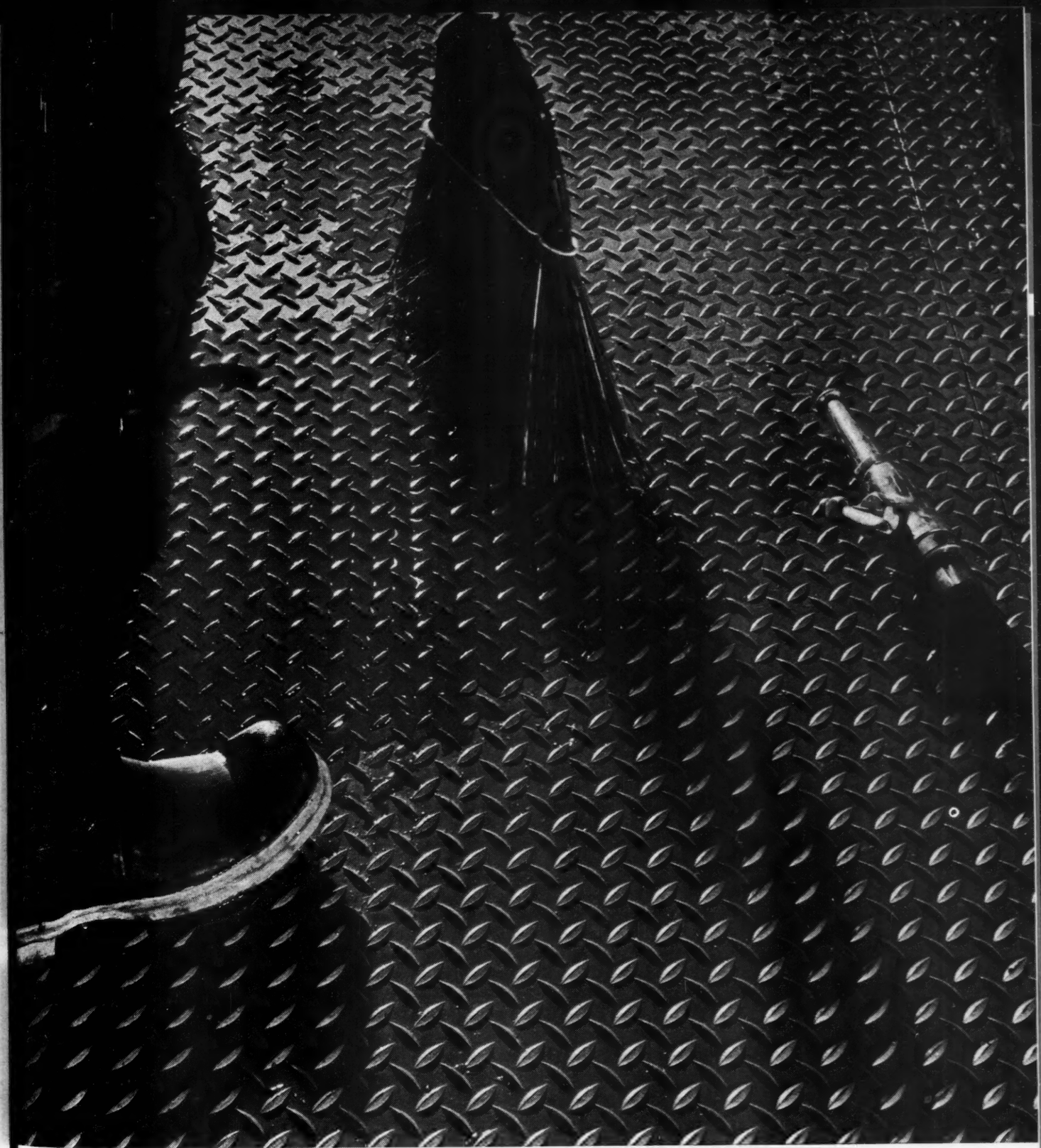

Photo shows the Super-Diamond Pattern of "A.W." Rolled Steel Floor Plate. Provides completely safe tread from any angle, under any condition.

Floor troubles ended for good . . . Wherever floors do double duty—traffic aisles, stair treads, railroad running boards and platforms, car steps, truck body floors, engine rooms, catwalks, refinery towers—"A.W." Rolled Steel Floor Plate helps to prevent dangerous and costly slips and falls. Reduces maintenance to a minimum. With "A.W." Floor Plate, there are no worn and slippery surfaces to endanger men on foot or upset floor trucks. Write for folder giving complete engineering data.

ALAN WOOD STEEL COMPANY

MAIN OFFICE AND MILLS, CONSHOHOCKEN, PENNA. : : SINCE 1826 : : DISTRICT OFFICES AND REPRESENTATIVES—Philadelphia, New York, Boston, Atlanta, Buffalo, Chicago, Cincinnati, Cleveland, Denver, Detroit, Houston, New Orleans, St. Paul, Pittsburgh, Roanoke, Sanford, N.C., St. Louis, Los Angeles, San Francisco, Seattle, Montreal—A. C. Leslie & Co. PRODUCTS INCLUDE—Steel Products in Carbon, Copper or Alloy Analyses : Sheared Steel Plates : : Hot Rolled Sheets and Strip : : "A.W." Rolled Steel Floor Plates : : Billets, Blooms and Slabs : : "Swede" Pig Iron : : Reading Cut Nails.

permission to issue, sell, and deliver $60,000,000 of collateral trust bonds, dated January 1, 1940—$30,000,000 to be due January 1, 1950, and bearing interest at 3½ per cent, and $30,000,000 due January 1, 1960, and bearing a four per cent rate, to be secured by cash (the proceeds of the sale of the collateral trust bonds supplemented by the company's contribution of cash equal to two per cent interest on the unifieds due July 1, 1940, plus the amount of discount) and subsequently by the unified bonds to the extent bought with the said cash by the collateral trust indenture trustee and by it extended.

The bonds are to be offered to the public by Morgan, Stanley & Co. at 101 per cent of par for the 10-year bonds and 100½ per cent of par for the 20-year bonds in each case with accrued interest to the date of delivery, with a discount spread of 1½ per cent on the 10-year bonds and two per cent on the 20-year bonds.

This is the issue over which a controversy has arisen as to whether or not the commission should require competitive bidding for railroad securities. Halsey, Stuart & Co. has protested to the company against what they allege to be the practice of awarding the issue to one firm without first having ascertained what competing financial houses would offer for the securities.

Former Senator Robert Bulkley of Ohio, acting on behalf of Halsey, Stuart & Co. and Otis & Co., called upon a number of commissioners and commission officials on December 28 to urge the commission to require competitive bidding on rail securities. Mr. Bulkley was particularly interested in having the commission require the L. & N. to ask for competitive bids on its bond issue. A member of Division 4 declined to comment on what action the commission might take.

MISSISSIPPI & SKUNA VALLEY.—*Stock.*—This company has asked the Interstate Commerce Commission for authority to issue $150,000 of common capital stock, consisting of 2,000 shares with a par value of $75, to be exchanged for 2,000 shares with a par value of $100 a share which are now outstanding in order that the company may reduce its common stock from $200,000 to $150,000. The petition states that the company has found that it has accumulated more working capital than it needs, so has decided to return $25 a share to each stockholder. It felt that this action was necessary in view of the fact that "it is so difficult to invest the money so as to protect it and secure an adequate return on it.

MISSOURI & ARKANSAS.—*Securities.*—This company has asked the Interstate Commerce Commission for authority to issue $500,000 of first mortgage 25-year four per cent bonds; to issue 3,500 shares of no par value capital stock; to effect surrender and cancellation of its now outstanding capital stock, consisting of 3,500 shares of common stock with a par value of $100 a share, by exchange of the no par stock and first mortgage bonds aggregating $280,000 of the proposed issue for the outstanding $100 par value capital stock; the remaining first mortgage bonds, aggregating $220,000 to be issued, except for certification by the trustee, and held in the treasury of the company until certification by the trustee, and sale, or pledge upon further orders of the commission.

NEW YORK CENTRAL.—*Operation.*—This company has sought an order from the Interstate Commerce Commission approving and authorizing the operation by it over the line of the Dillonvale & Smithfield, a line extending from Smithfield, Ohio, to Dillonvale, 9.8 miles, in accordance with an agreement entered into between the two companies.

NORFOLK SOUTHERN.—*Abandonment.*—Judge Way in federal district court at Norfolk, Va., has granted this company permission to sell certain terminal properties at Suffolk, Va., to the Virginian for $65,000 and to abandon its 50-mile branch between Suffolk and Edenton, N. C.

PACIFIC COAST.—*Abandonment.*—This company has asked the Interstate Commerce Commission for authority to abandon its Palmer branch, extending from Sisquoc, Calif., to Palmer, 3.9 miles.

READING.—*Abandonment.*—This company has asked the Interstate Commerce Commission for authority to abandon its Boston Run Colliery branch, 2,740 ft., all in Mahanoy Township, Schuylkill County, Pa.

RIO GRANDE SOUTHERN.—*R. F. C. Loan.*—Division 4 of the Interstate Commerce Commission has denied an application of this company for a $40,000 loan from the Reconstruction Finance Corporation. Division 4 found that the security offered for the loan, a $40,000 receiver's certificate, would not be adequate.

ST. LOUIS SOUTHWESTERN.—*Abandonment by the Stephenville North & South Texas.*—The Stephenville North & South Texas and the St. Louis Southwestern, respectively, have asked the Interstate Commerce Commission for authority to abandon the line and the operation of the line extending from Gatesville, Tex., to Hamilton, 32.7 miles.

TEXAS & PACIFIC.—*Equipment Trust Certificates and R. F. C. Financing.*—This company has been authorized by Division 4 of the Interstate Commerce Commission to assume liability for $1,335,000 of three per cent equipment trust certificates, maturing in 15 equal annual installments of $89,000 on January 15 in each of the years from 1941 to 1955, inclusive. At the same time Division 4 approved the purchase by the Reconstruction Finance Corporation of the entire issue at a price not in excess of par and accrued interest.

Commissioner Porter dissented, saying that "The cash payment is to be less than 0.7 per cent of the applicant's outlay for the equipment. Several times I have indicated my unwillingness to approve borrowing on new equipment of more than 90 per cent of the net cost thereof. Especially would such a policy incur no hardship here, for the applicant anticipates a cash balance by the end of the year of over $2,300,000 and is well able to pay at least 10 per cent if not 20 per cent in cash at the time of the purchase."

Railway Officers

EXECUTIVE

George C. Paterson, whose promotion to assistant to the vice-president in charge of operations of the Southern Pacific, with headquarters at San Francisco, Cal., was announced in the *Railway Age* of December 30, was born in San Francisco on August 16, 1890, and entered railway service on December 24, 1906, as a messenger in the

George C. Paterson

motive power department at San Francisco, later serving successively as a junior clerk, stenographer clerk, and appropriation clerk in that department. In April, 1920, he was promoted to appropriation clerk in the office of the president and four months later he was appointed assistant head clerk of the appropriation bureau in the same office. Mr. Paterson was advanced to head clerk of that bureau in May, 1922, and in June, 1925, he was appointed assistant chief clerk to the executive vice-president. He was further advanced to chief clerk to the president in September, 1925, and in January, 1929, he was appointed office manager to the vice-president in charge of operations. Mr. Paterson was appointed office manager of the joint forces of the vice-president in charge of operations and the general manager in January, 1932, and served in that capacity until his recent promotion on January 1.

OPERATING

C. B. Callaham, assistant superintendent on the St. Louis-San Francisco at Amory, Miss., has been appointed director of accident prevention, with headquarters at Springfield, Mo., succeeding **E. E. McGuire,** who retired on January 1.

G. R. Buchanan, trainmaster on the Atchison, Topeka & Santa Fe at Chanute, Kan., has been appointed acting superintendent of the Southern Kansas division, with headquarters at Chanute, succeeding **C. D. Notgrass,** who has been appointed acting superintendent of the Illinois and Missouri divisions, with headquarters at Chillicothe, Ill., relieving **C. W. Philhour,**

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who has been temporarily assigned to other duties. **H. G. Wood,** transportation inspector, has been appointed acting trainmaster at Chanute replacing Mr. Buchanan.

H. R. Wade, superintendent of the Western division of the St. Louis-San Francisco, with headquarters at Enid, Okla., has been transferred to the River division, with headquarters at Chaffee, Mo., replacing **C. K. Sims,** who has been transferred to Enid, relieving Mr. Wade.

J. P. Jackson, superintendent of the Scioto division of the Norfolk & Western, with headquarters at Portsmouth, Ohio, has been transferred in the same capacity to the Pocahontas division, with headquarters at Bluefield, W. Va., succeeding **O. M. Dawson,** who has been transferred to the Scioto division at Portsmouth.

V. R. Walling, engineer of maintenance of way of the Chicago & Western Indiana, and the Belt Railway Company of Chicago, has been appointed superintendent of the Chicago & Western Indiana, with headquarters at Chicago, succeeding **George Voelkner,** who has resigned to become assistant to the general manager of the Lehigh Valley, with headquarters at Bethlehem, Pa.

George D. Kennedy, trainmaster of the Buffalo division of the Delaware, Lackawanna & Western, has been promoted to superintendent of the Buffalo division, at Buffalo, N. Y., succeeding **W. G. Alexander,** resigned. **Charles H. Youst,** terminal trainmaster at Buffalo, has been promoted to trainmaster. **Joseph R. Thexton,** special representative on the staff of the general superintendent at Scranton, Pa., has been promoted to terminal trainmaster at Buffalo. **Leon A. Jenkins,** chief clerk to the superintendent of the Scranton division, has been promoted to superintendent of car service at Scranton, succeeding the late **V. D. Thayer.**

Jack E. Lester, whose promotion to superintendent of the Pecos division of the Atchison, Topeka & Santa Fe, with headquarters at Clovis, N. M., was announced

Jack E. Lester

in the *Railway Age* of December 30, was born at Santa Anna, Tex., on November 3, 1898, and entered railway service January 1, 1919, as an apprentice operator on the Panhandle & Santa Fe at Hereford, Tex. On June 1, 1919, he was promoted to operator and served in that capacity on the Plains division of the P. & S. F. On March 20, 1920, he was appointed chief clerk to the chief dispatcher at Amarillo, Tex., and on June 5, 1922, he was appointed train dispatcher at Amarillo. Mr. Lester was advanced to chief dispatcher at that point on November 1, 1935, and on July 1, 1937, he was promoted to trainmaster on the Slaton division, with headquarters at Slaton, Tex., the position he held until his promotion on January 1.

Albert W. Hervin, whose promotion to superintendent of the Trans-Missouri division of the Chicago, Milwaukee, St. Paul & Pacific, with headquarters at Miles City, Mont., was announced in the *Railway Age* of December 30, was born at St. Paul, Minn., on October 20, 1895, and graduated

Albert W. Hervin

in civil engineering from the University of Washington. He entered railway service on June 5, 1911, as a chainman on the Great Northern at Minot, N. D., later being promoted successively to tapeman, rodman, inspector of concrete and timber construction and inspector of snow shed construction. In February, 1919, he was appointed assistant roadmaster at Tye, Wash., and on May 20, 1919, he went with the Milwaukee as instrumentman at Butte, Mont. On November 17, 1920, he was promoted to roadmaster at St. Maries, Idaho, and two months later returned to Butte as instrumentman. On June 1, 1921, he was appointed roadmaster at Mobridge, S. D., and on September 19, 1922, he again returned to Butte as instrumentman. Mr. Hervin was promoted to assistant engineer at Spokane, Wash., on February 1, 1923, and on May 25, 1925, he was appointed roadmaster at Malden, Wash. On September 1, 1926, he was transferred to Three Forks, Mont., and two months later he was promoted to roadmaster and trainmaster on the C. M. & G. line, with headquarters at Joliet, Ill. On May 1, 1927, he was appointed trainmaster on the C&M division and later served as trainmaster on the Chicago Terminals, the Superior division and the Trans-Missouri division. On January 16, 1937, he was transferred to the Rocky Mountain division with headquarters at Butte, Mont., where he was located until his promotion on January 1.

TRAFFIC

E. T. Ginder has been appointed general agent of the Reading and the Central of New Jersey, with headquarters at Albany, N. Y., succeeding **D. J. Birmingham,** who has been transferred in the same capacity to Buffalo, N. Y., to succeed **W. E. Howes,** deceased.

W. D. Grubb, general agent for the Kansas City Southern and the Louisiana & Arkansas at Dallas, Tex., has been transferred to Chicago, relieving **H. H. Jordan,** who has been transferred to Minneapolis, Minn. Mr. Jordan succeeds **R. R. Feickert,** whose appointment as general agent at St. Louis, Mo., was announced in the *Railway Age* of December 23.

J. B. Davis, general freight agent of the Elgin, Joliet & Eastern, with headquarters at Chicago, has been promoted to assistant traffic manager, with the same headquarters, a newly created position, and **W. F. Hummew,** assistant general freight agent, has been advanced to general freight agent, with headquarters as before at Chicago, succeeding Mr. Davies.

Effective January 1, **Ralph E. Brooks,** chief clerk in the general freight office of the Atchison, Topeka & Santa Fe, at Topeka, Kan., has been promoted to assistant general freight agent, with the same headquarters, relieving **A. W. Kendall,** who succeeds to the duties of **B. F. E. Marsh,** without change of title or headquarters. Mr. Marsh, assistant general freight agent at Topeka, will retire on December 31.

L. C. Mahoney, freight traffic manager of the Chicago, Burlington & Quincy, has been promoted to general freight traffic manager, a newly created position, with headquarters as before at Chicago. **R. B. Battey,** and **G. A. Hoffelder,** assistant freight traffic managers, have been advanced to assistant general freight traffic managers, newly created positions, with headquarters as before at Chicago, and **H. L. Ford,** assistant freight traffic manager at Chicago, has been promoted to freight traffic manager at that point. Other promotions in the freight traffic department at Chicago include **F. J. Conrad,** foreign freight agent, promoted to assistant freight traffic manager, **C. J. Nelson,** coal traffic manager, advanced to fuel traffic manager, a newly created position, and **H. J. Polack,** assistant coal traffic manager, appointed assistant fuel traffic manager, also a newly created position.

L. J. Knowles, whose appointment as Commission traffic representative of the Canadian National at Montreal, Que., was reported in the *Railway Age* of December 23, was born at Nottingham, England, 52 years ago. Mr. Knowles received his education in Nottingham and Bristol, going to Canada in 1904. After previous railway experience, he occupied various positions in the freight tariff bureau of the Canadian Northern and Intercolonial railways from 1912 to 1918 and in 1920 be-

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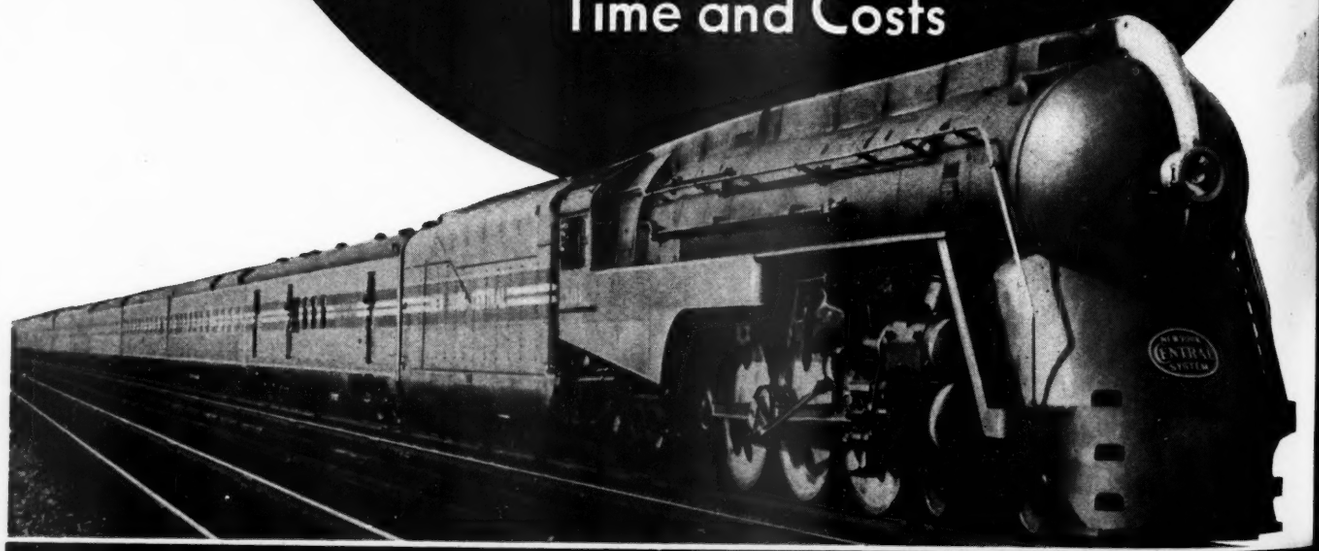
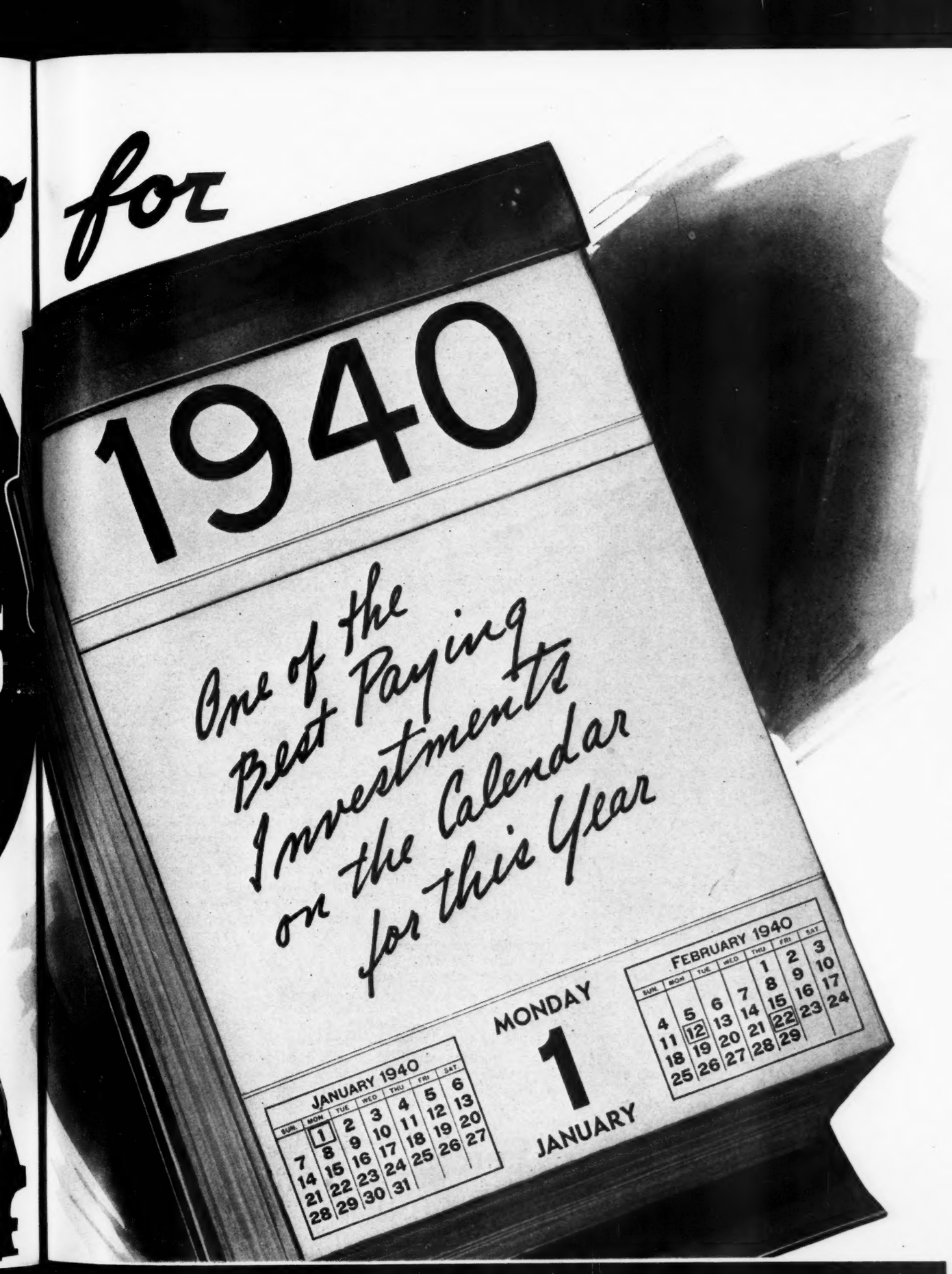
A Memo

HOLLOW FLEXIBLE STAYBOLTS

Provide Greater Safety
Increase Availability
Reduce Inspection
Time and Costs



FLANNERY BOLT



T COMPANY BRIDGEVILLE, PENNSYLVANIA

came chief of tariff bureau, Canadian National. In 1923 Mr. Knowles was appointed chief of rate section of the amal-

L. J. Knowles

gamated Canadian National and Grand Trunk system. After assisting in the department of the general freight traffic manager, in 1931 he was appointed special traffic representative on Canadian Railway Commission matters for the Canadian National, in addition to duties before the Interstate Commerce Commission, and last year his duties were extended to act as chairman of the Canadian National agreed charges committee dealing with contract rates under the new Transport Act. During the past 12 years Mr. Knowles has appeared as expert freight rate witness for Canadian railways and Canadian Freight Association in numerous rate cases before the Board of Railway Commissioners for Canada (now the Board of Transport Commissioners) and the Interstate Commerce Commission.

ENGINEERING AND SIGNALING

John R. W. Davis, whose retirement on January 1, as chief engineer of the Great Northern, with headquarters at St. Paul, Minn., was announced in the *Railway Age* of December 30, was born at Phoenixville, Pa., on October 26, 1868, and graduated

John R. W. Davis

from Lehigh University in 1891. He entered railway service in July of that year as a rodman on the New York, Lake Erie & Western (now a part of the Erie), and in April, 1892, was promoted to assistant supervisor. He was advanced to assistant engineer in December, 1892, and held that position until February, 1898, when he was promoted to division engineer on the Chicago & Erie (now a part of the Erie). Mr. Davis was further advanced to engineer of maintenance of way of the Erie in April, 1900. In January, 1901, he was appointed engineer of maintenance of way of the Chicago & Alton (now the Alton), and in November, 1901, he returned to the Erie as engineer of maintenance of way. Mr. Davis was appointed engineer of maintenance of way of the Great Northern in September, 1903, and in May, 1925, he was advanced to chief engineer, with headquarters at St. Paul, the position he held until his retirement. Mr. Davis is a charter member of the American Railway Engineering Association and a member of the American Society of Civil Engineers. During the period he was chief engineer of the Great Northern, he was in charge of several large improvement and construction projects, including the eight-mile Cascade tunnel through the Cascade Mountains in Washington (the longest railway bore in the Western Hemisphere), and the construction of the California extension linking the Great Northern with Western Pacific at Bieber, Cal.

A. B. Hillman, roadmaster of the Belt Railway Company of Chicago, has been promoted to engineer of maintenance of way of the Chicago & Western Indiana and the Belt Railway, with headquarters at Chicago, succeeding **V. R. Walling.**

Noel W. Smith, assistant chief engineer of the Pennsylvania, with headquarters at Philadelphia, Pa., retired on December 30 after more than 49 years of service with this company. Mr. Smith was born on December 25, 1869, at Williamsport, Pa., and first entered railway service in 1887 as a clerk on the Pennsylvania at that point. Two years later he entered Lehigh University and during summer vacations he worked on the Pennsylvania as a clerk, telegraph operator and rodman and on the Philadelphia & Reading (now the Reading) as a transitman. Following his graduation in 1893 with the degree of civil engineer, Mr. Smith returned to the Pennsylvania as a rodman and later served successively as assistant track supervisor, track supervisor and assistant engineer. In 1909, he was advanced to division engineer of the Middle division and in the following year he became superintendent at Media, Pa., later serving in the same capacity at Altoona, Pa. In 1920, Mr. Smith was promoted to assistant general manager of the Central region at Pittsburgh, Pa., and in the following year he was transferred to the Eastern region at Philadelphia. In 1924, at the request of the United States government, he was granted a leave of absence to permit him to study and report on the condition and operations of the Alaska Railroad. Following submission of his report he was appointed general manager of this road, holding this position from December 19, 1924, to August 1, 1928. He then returned to the Pennsylvania as assistant general manager of the Eastern region, being appointed general superintendent of motor service on April 15, 1929. On December 1 of the same year he was appointed assistant chief engineer of the sys-

Noel W. Smith

tem, holding this position until his retirement.

OBITUARY

J. P. De Vaughn, general passenger agent of the Baltimore & Ohio, with headquarters at Pittsburgh, Pa., died on December 26 at his home in that city. Mr. De Vaughn was born on April 14, 1881, in Wood County, W. Va., and entered the service of the Baltimore & Ohio in June, 1898, serving in various capacities in the freight station at Washington, Pa. He was appointed ticket agent at the same station in March, 1904, and in May, 1905, he was transferred to Pittsburgh, Pa., as assistant city ticket agent. In June, 1906, he became connected with the Buffalo, Rochester & Pittsburgh as city passenger and ticket agent at Pittsburgh. He was transferred to Buffalo as division passenger agent in January, 1911. In May, 1929, he was advanced to general passenger agent at Rochester, N. Y., continuing in that capacity with the Baltimore & Ohio, when that road absorbed the B. R. & P. early in 1932.

Colonel A. H. Webb, former general superintendent on the Missouri Pacific, with headquarters at Kansas City, Mo., whose death on December 24, at Wichita, Kan., was announced in the *Railway Age* of December 30, was born in Iron Mountain, Mo., on January 3, 1855, and entered railway service in 1874, as a brakeman on the Missouri Pacific, later becoming a conductor. In 1884, he was promoted to trainmaster at Little Rock, Ark., and two years later was advanced to assistant superintendent of the Wichita division, with headquarters at Wichita, Kan. Mr. Webb was promoted to superintendent of that division, with the same headquarters in 1894, and in June, 1917, he was further advanced to general superintendent, with headquarters at Kansas City. On January 1, 1921, he returned to Wichita as division superintendent and on November 1, 1926, he was appointed special assistant to the vice-president and general manager, with the same headquarters, the position he held until his retirement on January 1, 1928.